

Masahiko Minami (Ed.)

Handbook of Japanese Applied Linguistics

Handbooks of Japanese Language and Linguistics

Edited by
Masayoshi Shibatani
Taro Kageyama

Volume 10

Handbook of Japanese Applied Linguistics

Edited by
Masahiko Minami

DE GRUYTER
MOUTON

ISBN 978-1-61451-245-5
e-ISBN (PDF) 978-1-61451-183-0
e-ISBN (EPUB) 978-1-5015-0080-0
ISSN 2199-2851

Library of Congress Cataloging-in-Publication Data

A CIP catalog record for this book has been applied for at the Library of Congress.

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie;
detailed bibliographic data are available on the Internet at <http://dnb.dnb.de>.

© 2016 Walter de Gruyter Inc., Boston/Berlin

Cover photo: Hitomi Minami

Typesetting: RoyalStandard, Hong Kong

Printing and binding: CPI books GmbH, Leck

☼ Printed on acid-free paper

Printed in Germany

www.degruyter.com

Masayoshi Shibatani and Taro Kageyama

Introduction to the *Handbooks of Japanese Language and Linguistics*

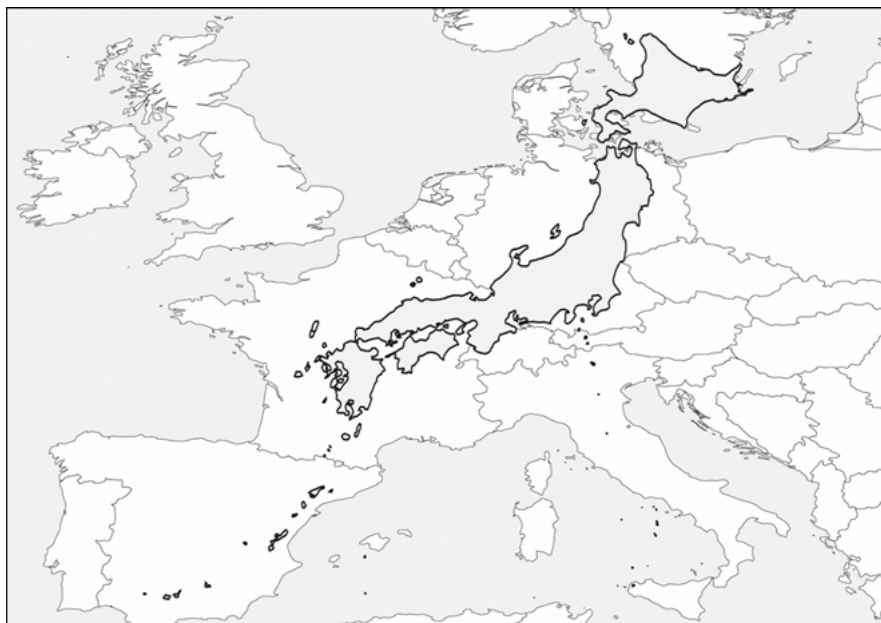
Comprising twelve substantial volumes, the *Handbooks of Japanese Language and Linguistics* (HJLL) series provides a comprehensive survey of practically all the major research areas of Japanese linguistics on an unprecedented scale, together with surveys of the endangered languages spoken in Japan, Ryukyuan and Ainu. What follows are introductions to the individual handbooks, to the general conventions adopted in this series, and the minimum essentials of contemporary Standard Japanese. Fuller descriptions of the languages of Japan, Japanese grammar, and the history of the Japanese language are available in such general references as Martin (1975), Shibatani (1990), and Frellesvig (2010).

1 Geography, Population, and Languages of Japan

Japan is situated in the most populous region of the world – Asia, where roughly one half of the world population of seven billion speak a variety of languages, many of which occupy the top tier of the ranking of the native-speaker population numbers. Japanese is spoken by more than 128 million people (as of 2013), who live mostly in Japan but also in Japanese emigrant communities around the world, most notably Hawaii, Brazil and Peru. In terms of the number of native speakers, Japanese ranks ninth among the world's languages. Due partly to its rich and long literary history, Japanese is one of the most intensely studied languages in the world and has received scrutiny under both the domestic grammatical tradition and those developed outside Japan such as the Chinese philological tradition, European structural linguistics, and generative grammar developed in America. The *Handbooks of Japanese Language and Linguistics* intend to capture the achievements garnered over the years through analyses of a wide variety of phenomena in a variety of theoretical frameworks.

As seen in Map 1, where Japan is shown graphically superimposed on Continental Europe, the Japanese archipelago has a vast latitudinal extension of approximately 3,000 kilometers ranging from the northernmost island, roughly corresponding to Stockholm, Sweden, to the southernmost island, roughly corresponding to Sevilla, Spain.

Contrary to popular assumption, Japanese is not the only language native to Japan. The northernmost and southernmost areas of the Japanese archipelago are inhabited by people whose native languages are arguably distinct from Japanese. The southernmost sea area in Okinawa Prefecture is dotted with numerous small islands



Map 1: *Japan as overlaid on Europe*

Source: Shinji Sanada. 2007. *Hōgen wa kimochi o tsutaeru [Dialects convey your heart]*.

Tokyo: Iwanami, p. 68.

where Ryukyuan languages are spoken. Until recent years, Japanese scholars tended to treat Ryukyuan language groups as dialects of Japanese based on fairly transparent correspondences in sounds and grammatical categories between mainland Japanese and Ryukyuan, although the two languages are mutually unintelligible. Another reason that Ryukyuan languages have been treated as Japanese dialects is that Ryukyuan islands and Japan form a single nation. In terms of nationhood, however, Ryukyu was an independent kingdom until the beginning of the seventeenth century, when it was forcibly annexed to the feudal domain of Satsuma in southern Kyushu.

A more recent trend is to treat Ryukyuan as forming a branch of its own with the status of a sister language to Japanese, following the earlier proposals by Chamberlain (1895) and Miller (1971). Many scholars specializing in Ryukyuan today even confer language status to different language groups within Ryukyuan, such as Amami language, Okinawan language, Miyako language, etc., which are grammatically distinct to the extent of making them mutually unintelligible. The prevailing view now has Japanese and Ryukyuan forming the Japonic family as daughter languages of Proto-Japonic. HJLL follows this recent trend of recognizing Ryukyuan as a sister language to Japanese and devotes one full volume to it. The ***Handbook of the Ryukyuan Languages*** provides the most up-to-date answers pertaining to Ryukyuan

language structures and use, and the ways in which these languages relate to Ryukyuan society and history. Like all the other handbooks in the series, each chapter delineates the boundaries and the research history of the field it addresses, comprises the most important and representative information on the state of research, and spells out future research desiderata. This volume also includes a comprehensive bibliography of Ryukyuan linguistics.

The situation with Ainu, another language indigenous to Japan, is much less clear as far as its genealogy goes. Various suggestions have been made relating Ainu to Paleo-Asiatic, Ural-Altaic, and Malayo-Polynesian or to such individual languages as Gilyak and Eskimo, besides the obvious candidate of Japanese as its sister language. The general consensus, however, points to the view that Ainu is related to Japanese quite indirectly, if at all, via the Altaic family with its Japanese-Korean subbranch (see Miller 1971; Shibatani 1990: 5–7 for an overview). Because Ainu has had northern Japan as its homeland and because HJLL is also concerned with various aspects of Japanese linguistics scholarship in general, we have decided to include a volume devoted to Ainu in this series. The *Handbook of the Ainu Language* outlines the history and current state of the Ainu language, offers a comprehensive survey of Ainu linguistics, describes major Ainu dialects in Hokkaido and Sakhalin, and devotes a full section to studies dealing with typological characteristics of the Ainu language such as polysynthesis and incorporation, person marking, plural verb forms, and aspect and evidentials.

2 History

Japan's rich and long literary history dates back to the seventh century, when the Japanese learned to use Chinese characters in writing Japanese. Because of the availability of abundant philological materials, the history of the Japanese language has been one of the most intensely pursued fields in Japanese linguistics. While several different divisions of Japanese language history have been proposed, Frellesvig (2010) proposes the following four linguistic periods, each embracing the main political epochs in Japanese history.

- | | | |
|--------------------------|-----------|--|
| 1. Old Japanese | 700–800 | (Nara period, 712–794) |
| 2. Early Middle Japanese | 800–1200 | (Heian period, 794–1185) |
| 3. Late Middle Japanese | 1200–1600 | (Kamakura period, 1185–1333;
Muromachi period, 1333–1573) |
| 4. Modern Japanese | 1600– | (Edo, 1603–1868; Meiji, 1868–1912;
Taishō, 1912–1926; Shōwa, 1926–1989;
Heisei, 1989–) |

This division reflects a major gulf between Pre-modern and Modern Japanese caused by some radical changes in linguistic structure during the Late Middle Japanese period. Modern Japanese is often further subdivided into Early Modern (Edo, 1603–1868), Modern (Meiji, 1868–1912; Taishō, 1912–1926), and Present-day Japanese (Shōwa, 1926–1989; Heisei, 1989–).

The *Handbook of Japanese Historical Linguistics* will present the latest research on better studied topics, such as segmental phonology, accent, morphology, and some salient syntactic phenomena such as focus constructions. It will also introduce areas of study that have traditionally been underrepresented, ranging from syntax and Sinico-Japanese (*kanbun*) materials to historical pragmatics, and demonstrate how they contribute to a fuller understanding of the overall history of Japanese, as well as outlining larger-scale tendencies and directions in changes that have taken place within the language over its attested history. Major issues in the reconstruction of prehistoric Japanese and in the individual historical periods from Old Japanese to Modern Japanese are discussed including writing and the materials for historical studies, influences of Sinico-Japanese on Japanese, the histories of different vocabulary strata, the history of honorifics and polite language, generative diachronic syntax, and the development of case marking.

3 Geographic and Social Variations

Because of the wide geographical spread of the Japanese archipelago from north to south, characterized by high mountain ranges, deep valleys, and wide rivers as well as numerous islands, Japanese has developed a multitude of dialects, many of which differ from each other in a way more or less like current descendants of the Romance language family. Like the historical studies, the research tradition of dialect studies has a unique place in Japanese linguistics, which has also attracted a large number of students, amateur collectors of dialect forms as well as professional linguists. The *Handbook of Japanese Dialects* surveys the historical backdrop of the theoretical frameworks of contemporary studies in Japanese geolinguistics and includes analyses of prominent research topics in cross-dialectal perspectives, such as accentual systems, honorifics, verbs of giving, and nominalizations. The volume also devotes large space to sketch grammars of dialects from the northern island of Hokkaido to the southern island of Kyushu, allowing a panoramic view of the differences and similarities in the representative dialects throughout Japan.

Besides the physical setting fostering geographic variations, Japanese society has experienced several types of social structure over the years, starting from the time of the nobility and court life of the Old and Early Middle Japanese periods, through the caste structure of the feudalistic Late Middle and Early Modern Japanese periods, to the modern democratic society in the Modern and Present-day Japanese

periods. These different social structures spawned a variety of social dialects including power- and gender-based varieties of Japanese. The ***Handbook of Japanese Sociolinguistics*** examines a wide array of sociolinguistic topics ranging from the history of Japanese sociolinguistics, including foreign influences and internal innovations, to the central topics of variations due to social stratification, gender differences, and discourse genre. Specific topics include honorifics and women's speech, critical discourse analysis, pragmatics of political discourse, contact-induced change, emerging new dialects, Japanese language varieties outside Japan, and language policy.

4 Lexicon and Phonology

The literary history of Japan began with early contacts with China. Chinese apparently began to enrich the Japanese lexicon in even pre-historic periods, when such deeply assimilated words as *uma* 'horse' and *ume* 'plum' are believed to have entered the language. Starting in the middle of the sixth century, when Buddhism reached Japan, Chinese, at different periods and from different dialect regions, has continuously contributed to Japanese in an immeasurable way affecting all aspects of grammar, but most notably the lexicon and the phonological structure, which have sustained further and continuous influences from European languages from the late Edo period on. Through these foreign contacts, Japanese has developed a complex vocabulary system that is composed of four lexical strata, each with unique lexical, phonological, and grammatical properties: native Japanese, mimetic, Sino-Japanese, and foreign (especially English).

The ***Handbook of Japanese Lexicon and Word Formation*** presents a comprehensive survey of the Japanese lexicon, word formation processes, and other lexical matters seen in the four lexical strata of contemporary Japanese. The agglutinative character of the language, coupled with the intricate system of vocabulary strata, makes it possible for compounding, derivation, conversion, and inflection to be closely intertwined with syntactic structure, giving rise to theoretically intriguing interactions of word formation processes and syntax that are not easily found in inflectional, isolating, or polysynthetic types of languages. The theoretically oriented studies associated with these topics are complemented by those oriented toward lexical semantics, which also bring to light theoretically challenging issues involving the morphology-syntax interface.

The four lexical strata characterizing the Japanese lexicon are also relevant to Japanese phonology as each stratum has some characteristic sounds and sound combinations not seen in the other strata. The ***Handbook of Japanese Phonetics and Phonology*** describes and analyzes the basic phonetic and phonological structures of modern Japanese with main focus on standard Tokyo Japanese, relegating the topics of dialect phonetics and phonology to the *Handbook of Japanese Dialects*.

The handbook includes several chapters dealing with phonological processes unique to the Sino-Japanese and foreign strata as well as to the mimetic stratum. Other topics include word tone/accent, mora-timing, sequential voicing (*rendaku*), consonant geminates, vowel devoicing and diphthongs, and the appearance of new consonant phonemes. Also discussed are phonetic and phonological processes within and beyond the word such as rhythm, intonation, and the syntax-phonology interface, as well as issues bearing on other subfields of linguistics such as historical and corpus linguistics, L1 phonology, and L2 research.

5 Syntax and Semantics

Chinese loans have also affected Japanese syntax, though the extent is unclear to which they affected Japanese semantics beyond the level of lexical semantics. In particular, Chinese loans form two distinct lexical categories in Japanese – verbal nouns, forming a subcategory of the noun class, and adjectival nouns (*keiyō dōshi*), which are treated as forming major lexical categories, along with noun, verb, and adjective classes, by those who recognize this as an independent category. The former denote verbal actions, and, unlike regular nouns denoting objects and thing-like entities, they can function as verbs by combining with the light verb *suru* ‘do’. The nominal-verbal Janus character of verbal nouns results in two widely observed syntactic patterns that are virtually synonymous in meaning; e.g., *benkyō-suru* (studying-DO) ‘to study’ and *benkyō o suru* (studying ACC do) ‘do studying’. As described in the *Handbook of Japanese Lexicon and Word Formation*, the lexical category of adjectival noun has been a perennial problem in the analysis of Japanese parts of speech. The property-concept words, e.g., *kirei* ‘pretty’, *kenkō* ‘health/healthy’, falling in this class do not inflect by themselves unlike native Japanese adjectives and, like nouns, require the inflecting copula *da* in the predication function – hence the label of adjectival noun for this class. However, many of them cannot head noun phrases – the hallmark of the nominal class – and some of them even yield nouns via *-sa* nominalization, which is not possible with regular nouns.

The Lexicon-Word Formation handbook and the *Handbook of Japanese Syntax* make up twin volumes because many chapters in the former deal with syntactic phenomena, as the brief discussion above on the two Sino-Japanese lexical categories clearly indicates. The syntax handbook covers a vast landscape of Japanese syntax from three theoretical perspectives: (1) traditional Japanese grammar, known as *kokugogaku* (lit. national-language study), (2) the functional approach, and (3) the generative grammar framework. Broad issues analyzed include sentence types and their interactions with grammatical verbal categories, grammatical relations (topic, subject, etc.), transitivity, nominalization, grammaticalization, voice (passives and

causatives), word order (subject, scrambling, numeral quantifier, configurationality), case marking (*ga/no* conversion, morphology and syntax), modification (adjectives, relative clause), and structure and interpretation (modality, negation, prosody, ellipsis). These topics have been pursued vigorously over many years under different theoretical persuasions and have had important roles in the development of general linguistic theory. For example, the long sustained studies on the grammatical of subject and topic in Japanese have had significant impacts on the study of grammatical relations in European as well as Austronesian languages. In the study of word order, the analysis of Japanese numeral quantifiers is used as one of the leading pieces of evidence for the existence of a movement rule in human language. Under case marking, the way subjects are case-marked in Japanese has played a central role in the study of case marking in the Altaic language family. Recent studies of nominalizations have been central to the analysis of their modification and referential functions in a wide variety of languages from around the globe with far-reaching implications to past studies of such phenomena as parts of speech, (numeral) classifiers, and relative clauses. And the study of how in Japanese prosody plays a crucial role in interpretation has become the basis of some important recent developments in the study of *wh*-questions.

The *Handbook of Japanese Semantics and Pragmatics* presents a collection of studies on linguistic meaning in Japanese, either as conventionally encoded in linguistic form (the field of semantics) or as generated by the interaction of form with context (the field of pragmatics). The studies are organized around a model that has long currency in traditional Japanese grammar, whereby the linguistic clause consists of a multiply nested structure centered in a propositional core of objective meaning around which forms are deployed that express progressively more subjective meaning as one moves away from the core toward the periphery of the clause. Following this model, the topics treated in this volume range from aspects of meaning associated with the propositional core, including elements of meaning structured in lexical units (lexical semantics), all the way to aspects of meaning that are highly subjective, being most grounded in the context of the speaker. In between these two poles of the semantics-pragmatics continuum are elements of meaning that are defined at the level of propositions as a whole or between different propositions (propositional logic) and forms that situate propositions in time as events and those situating events in reality including non-actual worlds, e.g., those hoped for (desiderative meaning), denied (negation), hypothesized (conditional meaning), or viewed as ethically or epistemologically possible or necessary (epistemic and deontic modality). Located yet closer to the periphery of the Japanese clause are a rich array of devices for marking propositions according to the degree to which the speaker is committed to their veracity, including means that mark differing perceptual and cognitive modalities and those for distinguishing information variously presupposed.

These studies in Japanese syntax and semantics are augmented by cross-linguistic studies that examine various topics in these fields from the perspectives of language

universals and the comparative study of Japanese and another language. The ***Handbook of Japanese Contrastive Linguistics*** sets as its primary goal uncovering principled similarities and differences between Japanese and other languages around the globe and thereby shedding new light on the universal and language-particular properties of Japanese. Topics ranging from inalienable possession to numeral classifiers, from spatial deixis to motion typology, and from nominalization to subordination, as well as topics closely related to these phenomena are studied in the typological universals framework. Then various aspects of Japanese such as resultative-progressive polysemy, entailment of event realization, internal-state predicates, topic constructions, and interrogative pronouns, are compared and contrasted with individual languages including Ainu, Koryak, Chinese, Korean, Newar, Thai, Burmese, Tagalog, Kapampangan, Lamaholot, Romanian, French, Spanish, German, English, Swahili, Sidaama, and Mayan languages.

6 Psycholinguistics and Applied Linguistics

HJLL includes two volumes containing topics related to wider application of Japanese linguistics and to those endeavors seeking grammar-external evidence for the psychoneurological reality of the structure and organization of grammar. By incorporating the recent progress in the study of the cognitive processes and brain mechanisms underlying language use, language acquisition, and language disorder, the ***Handbook of Japanese Psycholinguistics*** discusses the mechanisms of language acquisition and language processing. In particular, the volume seeks answers to the question of how Japanese is learned/acquired as a first or second language, and pursues the question of how we comprehend and produce Japanese sentences. The chapters in the acquisition section allow readers to acquaint themselves with issues pertaining to the question of how grammatical features (including pragmatic and discourse features) are acquired and how our brain develops in the language domain, with respect to both language-particular and universal features. Specific topics dealt with include Japanese children's perceptual development, the conceptual and grammatical development of nouns, Japanese specific language impairment, narrative development in the L1 cognitive system, L2 Japanese acquisition and its relation to L1 acquisition. The language processing section focuses on both L1 and L2 Japanese processing and covers topics such as the role of prosodic information in production/comprehension, the processing of complex grammatical structures such as relative clauses, the processing issues related to variable word order, and lexical and sentence processing in L2 by speakers of a different native language.

The ***Handbook of Japanese Applied Linguistics*** complements the Psycholinguistics volume by examining language acquisition from broader sociocultural per-

spectives, i.e., language as a means of communication and social behavioral system, emphasizing pragmatic development as central to both L1 and L2 acquisition and overall language/human development. Topics approached from these perspectives include the role of caregiver's speech in early language development, literacy acquisition, and acquisition of writing skills. Closely related to L1 and L2 acquisition/development are studies of bilingualism/multilingualism and the teaching and learning of foreign languages, including Japanese as a second language, where topics discussed include cross-lingual transfer from L1 to L2, learning errors, and proficiency assessment of second language acquisition. Chapters dealing with topics more squarely falling in the domain of applied linguistics cover the issues in corpus/computational linguistics (including discussions on CHILDES for Japanese and the KY corpus widely-used in research on Japanese as a second language), clinical linguistics (including discussions on language development in children with hearing impairment and other language disorders, with Down syndrome, or autism), and translation and interpretation. Technically speaking, Japanese Sign Language is not a variety of Japanese. However, in view of the importance of this language in Japanese society and because of the rapid progress in sign language research in Japan and abroad and what it has to offer to the general theory of language, chapters dealing with Japanese Sign Language are also included in this volume.

7 Grammatical Sketch of Standard Japanese

The following pages offer a brief overview of Japanese grammar as an aid for a quick grasp of the structure of Japanese that may prove useful in studying individual, thematically organized handbooks of this series. One of the difficult problems in presenting non-European language materials using familiar technical terms derived from the European grammatical tradition concerns mismatches between what the glosses may imply and what grammatical categories they are used to denote in the description. We will try to illustrate this problem below as a way of warning not to take all the glosses at their face value. But first some remarks are in order about the conventions of transcription of Japanese, glossing of examples, and their translations used in this series.

7.1 Writing, alphabetic transcription, and pronunciation

Customarily, Japanese is written by using a mixture of Chinese characters (for content words), *hiragana* (for function words such as particles, suffixes and inflectional endings), *katakana* (for foreign loans and mimetics), and sometimes Roman alphabet.

Because Japanese had no indigenous writing system, it developed two phonogram systems of representing a phonological unit of “mora”, namely *hiragana* and *katakana*, by simplifying or abbreviating (parts of) Chinese characters. *Hiragana* and *katakana* syllabaries are shown in Table 1, together with the alphabetic transcriptions adopted in the HJLL series.

Table 1: *Alphabetic transcriptions adopted in HJLL*

transcription	<i>a</i>	<i>ka</i>	<i>sa</i>	<i>ta</i>	<i>na</i>	<i>ha</i>	<i>ma</i>	<i>ya</i>	<i>ra</i>	<i>wa</i>	<i>n</i>
<i>hiragana</i>	あ	か	さ	た	な	は	ま	や	ら	わ	ん
<i>katakana</i>	ア	カ	サ	タ	ナ	ハ	マ	ヤ	ラ	ワ	ン
transcription	<i>i</i>	<i>ki</i>	<i>si</i>	<i>ti</i>	<i>ni</i>	<i>hi</i>	<i>mi</i>	–	<i>ri</i>	–	
<i>hiragana</i>	い	き	し	ち	に	ひ	み	–	り	–	
<i>katakana</i>	イ	キ	シ	チ	ニ	ヒ	ミ	–	リ	–	
transcription	<i>u</i>	<i>ku</i>	<i>su</i>	<i>tu</i>	<i>nu</i>	<i>hu</i>	<i>mu</i>	<i>yu</i>	<i>ru</i>	–	
<i>hiragana</i>	う	く	す	つ	ぬ	ふ	む	ゆ	る	–	
<i>katakana</i>	ウ	ク	ス	ツ	ヌ	フ	ム	ユ	ル	–	
transcription	<i>e</i>	<i>ke</i>	<i>se</i>	<i>te</i>	<i>ne</i>	<i>he</i>	<i>me</i>	–	<i>re</i>	–	
<i>hiragana</i>	え	け	せ	て	ね	へ	め	–	れ	–	
<i>katakana</i>	エ	ケ	セ	テ	ネ	ヘ	メ	–	レ	–	
transcription	<i>o</i>	<i>ko</i>	<i>so</i>	<i>to</i>	<i>no</i>	<i>ho</i>	<i>mo</i>	<i>yo</i>	<i>ro</i>	<i>o</i>	
<i>hiragana</i>	お	こ	そ	と	の	ほ	も	よ	ろ	を	
<i>katakana</i>	オ	コ	ソ	ト	ノ	ホ	モ	ヨ	ロ	ヲ	

Because of phonological change, the columns indicated by strikethroughs have no letters in contemporary Japanese, although they were filled in with special letters in classical Japanese. If all the strikethroughs were filled, the chart will contain 50 letters for each of *hiragana* and *katakana*, so the syllabary chart is traditionally called *Gojū-on zu* (chart of 50 sounds). To these should be added the letter ん or ン representing a moraic nasal [N], on the rightmost column.

The “50-sound chart”, however, does not exhaust the *hiragana* and *katakana* letters actually employed in Japanese, because the basic consonant sounds (*k*, *s*, *t*, *h*) have variants. The sound represented by the letter *h* is historically related to the sound represented by *p*, and these voiceless obstruents (*k*, *s*, *t*, and *p*) have their respective voiced counterparts (*g*, *z*, *d*, and *b*). Table 2 shows letters for these consonants followed by five vowels.

Table 2: Letters for voiced obstruents and bilabial [p]

transcription	<i>ga</i>	<i>za</i>	<i>da</i>	<i>ba</i>	<i>pa</i>
<i>hiragana</i>	が	ざ	だ	ば	ぱ
<i>katakana</i>	ガ	ザ	ダ	バ	パ
transcription	<i>gi</i>	<i>zi</i>	<i>di</i>	<i>bi</i>	<i>pi</i>
<i>hiragana</i>	ぎ	じ	ぢ	び	ぴ
<i>katakana</i>	ギ	ジ	ヂ	ビ	ピ
transcription	<i>gu</i>	<i>zu</i>	<i>du</i>	<i>bu</i>	<i>pu</i>
<i>hiragana</i>	ぐ	ず	づ	ぶ	ぷ
<i>katakana</i>	グ	ズ	ヅ	ブ	プ
transcription	<i>ge</i>	<i>ze</i>	<i>de</i>	<i>be</i>	<i>pe</i>
<i>hiragana</i>	げ	ぜ	で	べ	ぺ
<i>katakana</i>	ゲ	ゼ	デ	ベ	ペ
transcription	<i>go</i>	<i>zo</i>	<i>do</i>	<i>bo</i>	<i>po</i>
<i>hiragana</i>	ご	ぞ	ど	ぼ	ぽ
<i>katakana</i>	ゴ	ゾ	ド	ボ	ポ

It is important to note that Tables 1 and 2 show the conventional letters and alphabetical transcription adopted by the HJLL series; they are not intended to represent the actual pronunciations of Japanese vowels and consonants. For example, among the vowels, the sound represented as “u” is pronounced as [u] with unrounded lips. Consonants may change articulation according to the following vowels. Romanization of these has been controversial with several competing proposals.

There are two Romanization systems widely used in Japan. One known as the Hepburn system is more widely used in public places throughout Japan such as train stations, street signs, as well as in some textbooks for learners of Japanese. This system is ostensibly easier for foreigners familiar with the English spelling system. The *Kunreishiki* (the cabinet ordinance system) is phonemic in nature and is used by many professional linguists. The essential differences between the two Romanization systems center on palatalized and affricate consonants, as shown in Table 3 below by some representative syllables for which two Romanization renditions differ:

Table 3: *Two systems of Romanization*

Hiragana	IPA	Hepburn	Kunreishiki
し	[ʃi]	shi	si
しゃ	[ʃa]	sha	sya
しゅ	[ʃw]	shu	syu
しょ	[ʃo]	sho	syo
じ and ぢ	[dʒi]	ji	zi
じゃ	[dʒa]	ja	zya
じゅ	[dʒw]	ju	zyu
じょ	[dʒo]	jo	zyo
ち	[tʃi]	chi	ti
ちゃ	[tʃa]	cha	tya
ちゅ	[tʃw]	chu	tyu
ちょ	[tʃo]	cho	tyo
つ	[tsw]	tsu	tu
づ and ず	[dzw]	dzu	zu
ふ	[ɸw]	fu	hu

Except for the volumes on Ryukyuan, Ainu, and Japanese dialects, whose phonetics differ from Standard Japanese, HJLL adopts the Kunreishiki system for rendering cited Japanese words and sentences but uses the Hepburn system for rendering conventional forms such as proper nouns and technical linguistic terms in the text and in the translations of examples.

The cited Japanese sentences in HJLL look as below, where the first line transliterates a Japanese sentence in Kunreishiki Romanization, the second line contains interlinear glosses largely following the Leipzig abbreviation convention, and the third line is a free translation of the example sentence.

- (1) *Taroo wa Ziroom to Tookyoo e it-te kutosita o kat-ta.*
 Taro TOP Jiro COM Tokyo ALL go-GER sock ACC buy-PST
 ‘Taro went to Tokyo with Jiro and bought socks.’

The orthographic convention of rendering Japanese is to represent a sentence with an uninterrupted sequence of Sino-Japanese characters and *katakana* or *hiragana* syllabaries without a space for word segmentation, as in 太郎は次郎と東京へ行って靴下を買った for (1). In line with the general rules of Romanization adopted in

books and articles dealing with Japanese, however, HJLL transliterates example sentences by separating word units by spaces. The example in (1) thus has 10 words. Moreover, as in *it-te* (go-GERUNDIVE) and *kat-ta* (buy-PAST) in (1), word-internal morphemes are separated by a hyphen whenever necessary, although this practice is not adopted consistently in all of the HJLL volumes. Special attention should be paid to particles like *wa* (topic), *to* ‘with’ and *e* ‘to, toward’, which, in the HJLL representation, are separated from the preceding noun or noun phrase by a space (see section 7.3). Remember that case and other kinds of particles, though spaced, form phrasal units with their preceding nouns.

7.2 Word order

As seen in (1), Japanese is a verb-final, dependent-marking agglutinative language. It is basically an SOV language, which marks the nominal dependent arguments by particles (*wa*, *to*, *e*, and *o* above), and whose predicative component consists of a verbal-stem, a variety of suffixes, auxiliary verbs, and semi-independent predicate extenders pertaining to the speech act of predication (see section 7.6). While a verb is rigidly fixed in sentence final position, the order of subject and object arguments may vary depending on pragmatic factors such as emphasis, background information, and cohesion. Thus, sentence (2a) with the unmarked order below, in principle, may vary in multiple ways as shown by some possibilities in (2b)–(2d).

- (2) a. *Taroo ga Hanako ni Ziroo o syookai-si-ta.*
 Taro NOM Hanako DAT Jiro ACC introducing-do-PST
 ‘Taro introduced Jiro to Hanako.’
 b. *Taroo ga **Ziroo o** Hanako ni syookai-si-ta.*
 c. ***Hanako ni** Taroo ga Ziroo o syookai-si-ta.*
 d. ***Ziroo o** Taroo ga Hanako ni syookai-si-ta.*

Adverbs, likewise, can be rather freely placed, though each type of adverbs has its basic position.

- (3) a. ***Saiwainimo** Hanako ga gohan o tai-te kure-te i-ta.*
 luckily Hanako NOM rice ACC cook-GER GIVE-GER BE-PST
 ‘Luckily Hanako had done the favor of cooking the rice (for us).’
 b. *Hanako ga **saiwainimo** gohan o tai-te kure-te i-ta.*
 c. *Hanako ga gohan o **saiwainimo** tai-te kure-te i-ta.*

Notice that while the verbal complex in the sentence above is not as tightly organized as a complex involving suffixes, a sentence adverb cannot be placed within the verbal complex, showing that the sequence of *tai-te kure-te i-ta* forms a tighter constituent,

which, however, permits insertion of the topic particle *wa* after each of the gerundive forms. (See section 7.4 below on the nature of gerundive forms in Japanese.)

As the normal position of sentence adverbs is sentence initial, manner and resultative adverbs have an iconically-motivated position, namely before and after the object noun phrase, respectively, as below, though again these adverbs may move around with varying degrees of naturalness:

- (4) *Hanako ga isoide gohan o tai-te kure-ta.*
 Hanako NOM hurriedly rice ACC cook-GER GIVE-PST
 ‘Hanako did the favor of cooking the rice hurriedly (for us).’
- (5) *Hanako ga gohan o yawarakaku tai-te kure-ta.*
 Hanako NOM rice ACC softly cook-GER GIVE-PST
 ‘Hanako did the favor of cooking the rice soft (for us).’

The fact that an object noun phrase can be easily separated from the verb, as in (2b.d), and that adverbs can freely intervene between an object and a verb, as in (5), has raised the question whether Japanese has a verb phrase consisting of a verb and an object noun phrase as a tightly integrated constituent parallel to the VP in English (cf. **cook hurriedly the rice* – the asterisk marks ungrammatical forms).

7.3 NP structure

Noun phrases, when they occur as arguments or adjuncts, are marked by case particles or postpositions that are placed after their host nouns. Because case markers can be set off by a pause, a filler, or even longer parenthetical material, it is clear that they are unlike declensional affixes in inflectional languages like German or Russian. Their exact status, however, is controversial; some researchers regard them as clitics and others as (non-independent) words.

Elaboration of Japanese noun phrases is done by prenominal modifiers such as a demonstrative, a genitive noun phrase, or an adjective, as below, indicating that Japanese is a consistent head-final language at both nominal and clausal levels.

- (6) a. *kono Taroo no kaban*
 this Taro GEN bag
 lit. ‘this Taro’s bag’
- b. *Taroo no kono kaban*
 Taro GEN this bag
 lit. ‘Taro’s this bag’

Japanese lacks determiners of the English type that “close off” NP expansion. The literal translations of the Japanese forms above are ungrammatical, indicating that English determiners like demonstratives and genitive noun phrases do not allow further expansion of an NP structure. Also seen above is the possibility that prenominal modifiers can be reordered just like the dependents at the sentence level. The order of prenominal modifiers, however, is regulated by the iconic principle of placing closer to the head noun those modifiers that have a greater contribution in specifying the nature and type of the referent. Thus, descriptive adjectives tend to be placed closer to a head noun than demonstratives and genitive modifiers of non-descriptive types. Interesting is the pattern of genitive modifiers, some of which are more descriptive and are placed closer to the head noun than others. Genitives of the same semantic type, on the other hand, can be freely reordered. Compare:

- (7) a. *Yamada-sensei no kuroi kaban*
 Yamada-professor GEN black bag
 ‘Professor Yamada’s black bag’
 b. **kuroi Yamada-sensei no kaban*
 (O.K. with the reading of ‘a bag of Professor Yamada who is black’)
- (8) a. *Yamada-sensei no gengogaku no koogi*
 Yamada-professor GEN linguistics GEN lecture
 ‘Professor Yamada’s linguistics lecture’
 b. **gengogaku no Yamada-sensei no koogi*
 (O.K. with the reading of ‘a lecture by Professor Yamada of linguistics’)
- (9) a. *Yamada-sensei no kinoo no koogi*
 Yamada-professor GEN yesterday GEN lecture
 lit. ‘Professor Yamada’s yesterday’s lecture’ ‘Yesterday’s lecture by Professor Yamada’
 b. *Kinoo no Yamada-sensei no koogi*
- (10) a. *oomori no sio-azi no raamen*
 big.serving GEN salt-tasting GEN ramen
 lit. ‘big-serving salt-tasting ramen noodles’
 b. *sio-azi no oomori no raamen*
- (11) a. *atui sio-azi no raamen*
 hot salt-tasting GEN ramen
 ‘hot salt-tasting ramen noodles’
 b. *sio-azi no atui ramen*

Numeral classifiers (CLFs) pattern together with descriptive modifiers so that they tend to occur closer to a head noun than a possessive genitive phrase.

- (12) a. *Taroo no san-bon no enpitu*
 Taro GEN three-CLF GEN pencil
 ‘Taro’s three pencils’
 b. **san-bon no Taroo no enpitu*

Numeral classifiers also head an NP, where they play a referential function and where they can be modified by a genitive phrase or an appositive modifier, as in (13a.b). They may also “float” away from the head noun and become adverbial, as in (13c).

- (13) a. *Taroo wa gakusei no san-nin o mikake-ta.*
 Taro TOP student GEN three-CLF ACC see.by.chance-PST
 ‘Taro saw three of students by chance.’
 b. *Taroo wa gakusei san-nin o mikake-ta.*
 Taro TOP student three-CLF ACC see.by.chance-PST
 lit. ‘Taro saw student-threes by chance.’
 c. *Taroo wa gakusei o san-nin mikake-ta.*
 Taro TOP student ACC three-CLF see.by.chance-PST
 ‘Taro saw students, three (of them), by chance.’

As in many other SOV languages, the so-called relative clauses are also prenominal and are directly placed before their head nouns without the mediation of “relative pronouns” like the English *which* or *who* or “complementizers” like *that*. The predicates in relative clauses are finite, taking a variety of tense and aspect. The subject may be replaced by a genitive modifier. Observe (14a).

- (14) a. *Boku mo [Taroo ga/no kat-ta] hon o kat-ta.*
 I ADVPART Taro NOM/GEN buy-PST book ACC buy-PST
 ‘I also bought the book which Taro bought.’
 b. *Boku mo [Taroo ga/no kat-ta] no o kat-ta.*
 I ADVPART Taro NOM/GEN buy-PST NM ACC buy-PST
 ‘I also bought the one which Taro bought.’

The structure used as a modifier in the relative clause construction can also head a noun phrase, where it has a referential function denoting an entity concept evoked by the structure. In Standard Japanese such a structure is marked by the nominalization particle *no*, as in (14b).

7.4 Subject and topic

Some of the sentences above have noun phrases marked by the nominative case particle *ga* and some by the topic marker *wa* for what appear to correspond to the subject noun phrases in the English translations. This possibility of *ga*- and *wa*-marking is seen below.

- (15) a. *Yuki ga siro-i.*
 snow NOM white-PRS
 ‘The snow is white.’
- b. *Yuki wa siro-i.*
 snow TOP white-PRS
 ‘Snow is white.’

As the difference in the English translations indicates, these two sentences are different in meaning. Describing the differences between topic and non-topic sentences has been a major challenge for Japanese grammarians and teachers of Japanese alike. The difference in the English translations above, however, is indicative of how these two sentences might differ in meaning. Sentence (15a) describes a state of affairs involving specific snow just witnessed, whereas (15b) is a generic statement about a property of snow unbounded by time. Thus, while (15a) would be uttered only when the witnessed snow is indeed white, (15b) would be construed true even though we know that there are snow piles that are quite dirty.

A similar difference is seen in verbal sentences as well.

- (16) a. *Tori ga tob-u.*
 bird NOM fly-PRS
 ‘A bird is flying/is about to fly.’
- b. *Tori wa tob-u.*
 bird TOP fly-PRS
 ‘Birds fly.’

Non-topic sentences like (15a) and (16a) are often uttered with an exclamation accompanying a sudden discovery of a state of affairs unfolding right in front of one’s eyes. The present tense forms (*-i* for adjectives and *-(r)u* for verbs) here anchor the time of this discovery to the speech time. The present tense forms in (15b) and (16b), on the other hand, mark a generic tense associated with a universal statement.

These explanations can perhaps be extended to a time-bound topic sentence seen in (17b) below.

- (17) a. *Taroo ga hasit-ta.*
 Taro NOM run-PST
 ‘Taro NOM ran.’
- b. *Taroo wa hasit-ta.*
 Taro TOP run-PST
 ‘Taro ran.’

That is, while (17a) reports an occurrence of a particular event at a time prior to the speech time, (17b) describes the nature of the topic referent – that Taro was engaged in the running activity – as a universal truth of the referent, but universal only with respect to a specifically bound time marked by the past tense suffix.

Topics need not be a subject, and indeed any major sentence constituent, including adverbs, may be marked topic in Japanese, as shown below.

- (18) a. *Sono hon wa Taroo ga yon-de i-ru.*
 that book TOP Taro NOM read-GER BE-PRS
 ‘As for that book, Taro is reading (it).’
- b. *Kyoo wa tenki ga yo-i.*
 today TOP weather NOM good-PRS
 ‘As for today, the weather is good.’
- c. *Sonnani wa hayaku wa hasir-e na-i.*
 that.way TOP quickly TOP run-POTEN NEG-PRS
 ‘That quickly, (I) cannot run.’

7.4 Complex sentences

As in many Altaic languages, compound sentences in Japanese do not involve a coordinate conjunction like English *and*. Instead, clauses are connected by the use of inflected verb forms, as in (19a) below, where the *-i* ending is glossed in the HJLL series as either INF (infinitive) or ADVL (adverbial) following the Japanese term *ren'yō-kei* for the form. While the *-i* ending in the formation of compound sentences is still used today, especially in writing, the more commonly used contemporary form involves a conjunctive particle *-te* following the *-i* infinitive form, as in (19b) below. In HJLL, this combination is glossed as GER (gerundive), though the relevant Japanese forms do not have the major nominal use of English gerundive forms.

- (19) a. *Hana wa sak-i, tori wa uta-u.*
 flower TOP bloom-INF bird TOP sing-PRS
 ‘Flowers bloom and birds sing.’

- b. *Hana wa sa.i-te, tori wa uta-u.*
 flower TOP bloom-GER bird TOP sing-PRS
 ‘Flowers bloom and birds sing.’

Both the *-i* and *-te* forms play important roles in Japanese grammar. They are also used in clause-chaining constructions for serial events (20a), and in complex sentences (20b)–(20d), as well as in numerous compound verbs (and also in many compound nouns) such as *sak-i hokoru* (bloom-INF boast) ‘be in full bloom’, *sak-i tuzukeru* (bloom-INF continue) ‘continue blooming’, *sa.i-te iru* (bloom-GER BE) ‘is blooming’, and *sa.i-te kureru* (bloom-GER GIVE) ‘do the favor of blooming (for me/us)’.

- (20) a. *Taroo wa [ok-i/ok.i-te], [kao o ara-i/arat-te],*
 Taro TOP rise-INF/rise-GER face ACC wash-INF/wash-GER
[gohan o tabe-ta].
 meal ACC eat.PST
 ‘Taro got up, washed his face, and ate a meal.’
- b. *Taroo wa [sakana o tur-i] ni it-ta.*
 Taro TOP fish ACC catch-INF DAT go-PST
 ‘Taro went to catch fish.’
- c. *Taroo wa [aruk-i nagara] hon o yon-da.*
 Taro TOP walk-INF SIMUL book ACC read-PST
 ‘Taro read a book while walking.’
- d. *Taroo wa [Hanako ga ki-ta no] ni awa-na-katta.*
 Taro TOP Hanako NOM come-PST NM DAT see-NEG-PST.
 ‘Taro did not see (her), even though Hanako came.’

(20d) has the nominalized clause marked by the particle *no* followed by the dative *ni*, also seen in (20b) marking the purposive form. Now the *no-ni* sequence has been reanalyzed as a concessive conjunction meaning ‘even though’.

7.5 Context dependency

The context dependency of sentence structure in Japanese is much more clearly pronounced than in languages like English. Indeed, it is rare that Japanese sentences express all the arguments of a verb such as a subject (or topic) and an object noun phrase included in the sentences used above for illustrative purposes. A typical dialog would take the following form, where what is inferable from the speech context is not expressed.

- (21) a. Speaker A: *Tokorode, Murakami Haruki no saisin-saku yon-da ka.*
 by.the.way Murakami Haruki GEN newest-work read-PST Q
 ‘By the way, have (you) read Haruki Murakami’s latest work?’
- b. Speaker B: *Un, moo yon-da.*
 uh-hu already read-PST
 ‘Uh-hu, (I) already read (it)’.

In (21a) A’s utterance is missing a subject noun phrase referring to the addressee, and B’s response in (21b) is missing both subject and object noun phrases. In some frameworks, sentences like these are analyzed as containing zero pronouns or as involving a process of “pro drop”, which deletes assumed underlying pronouns. This kind of analysis, however, ignores the role of speech context completely and incorporates information contextually available into sentence structure. In an analysis that takes seriously the dialogic relationship between speech context and sentence structure, the expressions in (21) would be considered full sentences as they are.

7.6 Predicative verbal complexes and extenders

Coding or repeating contextually determinable verb phrases, as in (21b), is less offensive than expressing contextually inferable noun phrases presumably because verb phrases have the predication function of assertion, and because they also code a wide range of other types of speech acts and of contextual information pertaining to the predication act. Declarative sentences with plain verbal endings like the one in (21b) are usable as “neutral” expressions in newspaper articles and literary works, where no specific reader is intended. In daily discourse, the plain verbal forms “explicitly” code the speaker’s attitude toward the hearer; namely, that the speaker is treating the hearer as his equal or inferior in social standing, determined primarily by age, power, and familiarity. If the addressee were socially superior or if the occasion demanded formality, a polite, addressee honorific form with the suffix *-masu* would be used, as below.

- (22) *Hai, moo yom-i-masi-ta.*
 yes already read-INF-POL-PST
 ‘Yes, (I have) already read (it).’

The referent honorific forms are used when the speaker wishes to show deference toward the referent of arguments – subject honorific and object honorific (or humbling) forms depending on the type of argument targeted. If (21b) were to be uttered in reference to a social superior, the following would be more appropriate:

- (23) *Un, (Yamada-sensei wa) moo yom-are-ta.*
 uh-hu (Yamada-professor TOP) already read-SUB.HON-PST
 ‘Uh-hu, (Professor Yamada has) already read (it).’

This can be combined with the polite ending *-masu*, as below, where the speaker’s deference is shown to both the referent of the subject noun phrase and the addressee:

- (24) *Hai, (Yamada-sensei wa) moo yom-are-masi-ta.*
 Yes (Yamada-professor TOP) already read-HON-POL-PST
 ‘Yes, (Professor Yamada has) already read (it).’

As these examples show, Japanese typically employs agglutinative suffixes in the elaboration of verbal meanings associated with a predication act. The equivalents of English auxiliary verbs are either suffixes or formatives connected to verb stems and suffixed forms in varying degrees of tightness. These are hierarchically structured in a manner that expresses progressively more subjective and interpersonal meaning as one moves away from the verb-stem core toward the periphery. For example, in the following sentence a hyphen marks suffixal elements tightly bonded to the preceding form, an equal sign marks a more loosely connected formative, which permits insertion of certain elements such as the topic particle *wa*, and a space sets off those elements that are independent words following a finite predicate form, which may terminate the utterance.

- (25) *(Taroo wa) ik-ase-rare-taku=na-katta rasi-i mitai des-u wa.*
 (Taro TOP) go-CAUS-PASS-DESI=NEG-PST CONJEC-PRS UNCERT POLCOP-PRS SFP
 ‘(Taro) appears to seem to not want to have been forced to go, I tell you.’

The final particle *wa* above encodes the information that the speaker is female. A male speaker would use *yo* or *da yo*, the latter a combination of the plain copula and *yo*, instead of *desu wa* above, or combinations such as *da ze* and *da zo* in rough speech.

Non-declarative Japanese sentences, on the other hand, frequently suppress auxiliary verbs, the copula, and the question particle especially in casual speech, where intonation and tone of voice provide clues in guessing the intended speech act. Casual interrogatives take the form of (26a) with a nominalization marker bearing a rising intonation, marked by the question mark in the transcription, whereas fuller versions have the interrogative particle *ka* or a combination of the polite copula and *ka*, as in (26b).

- (26) a. *Moo kaeru no?*
 already return NM
 ‘Going home already?’

- b. *Moo kaeru no (desu) ka.*
 already return NM (POLCOP) Q
 ‘Going home already?’

Requests are made with the aid of an auxiliary-like “supporting” verb *kureru* ‘GIVE (ME THE FAVOR OF. . .)’, its polite form *kudasai*, or its intimate version *tyoodai*, as seen in (27a). Again, these forms are often suppressed in a highly intimate conversation and may result in a form like (27b).

- (27) a. *Hayaku kaet-te kure/kudasai/tyoodai.*
 soon return-GER GIVE/GIVE.POL/GIVE.INTI
 ‘(Please) come home soon (for me/us).’
 b. *Hayaku kaet-te ne.*
 soon return-GER SFP
 ‘(Please) come home soon, won’t you?’

The use of dependent forms (e.g., the gerundive *-te* form above) as independent sentences is similar to that of subjunctive forms of European languages as independent sentences, as illustrated by the English sentence below.

- (28) *If you would give me five thirty-cent stamps.*

Conditionals are used as independent suggestion sentences in Japanese as well. For example, (29a) has a fuller version like (29b) with the copula as a main-clause verb, which can also be suppressed giving rise to the truncated form (29c).

- (29) a. *Hayaku kaet-tara?*
 quickly return-COND
 lit. ‘If return quickly.’ ‘Why don’t you go home quickly?’
 b. *Hayaku kaet-tara ikaga desu ka.*
 quickly return-COND how POLCOP Q
 lit. ‘How is it if (you) went home quickly?’
 c. *Hayaku kaet-tara ikaga?*
 quickly return-COND how
 ‘Why don’t (you) go home quickly?’

Understanding Japanese utterances requires full recourse to the elements of speech context, such as the nature of the speaker and the hearer and the social relationship between them, the information “in the air” that is readily accessible to the interlocutors, and the formality of the occasion. Indeed, the difficult part of the art of

speaking Japanese is knowing how much to leave out from the utterance and how to infer what is left unsaid.

8 Conclusion

Many of the interesting topics in Japanese grammar introduced above are discussed in great detail in the Lexicon-Word formation handbook and the Syntax volume. The Historical handbook also traces developments of some of the forms and constructions introduced above. The Sociolinguistics volume gives fuller accounts of the sentence variations motivated by context and discourse genre.

References

- Chamberlain, Basil H. 1895. *Essay in aid of a grammar and dictionary of the Luchuan language*. Transactions of the Asiatic Society of Japanese, vol. 23 supplement.
- Frellesvig, Bjarke. 2010. *A history of the Japanese language*. Cambridge: Cambridge University Press.
- Martin, Samuel E. 1975. *A reference grammar of Japanese*. New Haven: Yale University Press.
- Miller, Roy A. 1971. *Japanese and the other Altaic languages*. Chicago: University of Chicago Press.
- Shibatani, Masayoshi. 1990. *The languages of Japan*. Cambridge: Cambridge University Press.

Appendix: List of abbreviations for HJLL

1	first person
2	second person
3	third person
A	agent-like argument of canonical transitive verb
ABL	ablative
ACC	accusative
ACOP	adjectival copula
ADJ	adjective
ADN	adnominal
ADV	adverb(ial(izer))
ADVL	adverbial
ADVPART	adverbial particle
AGR	agreement
AGT	agent
ALL	allative
AN	adjectival noun

ANTIP	antipassive
AP	adverbial particle, adjective phrase
APPL	applicative
ART	article
ASP	aspect
ATTR	attributive
AUX	auxiliary
AUXV	auxiliary verb
C	consonant
CAUS	causative
CLF	classifier
COHORT	cohortative
COM	comitative
COMP	complementizer
COMPL	completive
CONC	concessive
CONCL	conclusive
COND	conditional
CONJEC	conjectural
CONJCT	conjunctive
CONT	continuative
COP	copula
CVB	converb
DAT	dative
D	demonstrative
DECL	declarative
DEF	definite
DEM	demonstrative
DET	determiner
DESI	desiderative
DIST	distal
DISTR	distributive
DO	direct object
DU	dual
DUR	durative
EMPH	emphatic
ERG	ergative
ETOP	emphatic topic
EVID	evidential
EXCL	exclamatory, exclusive
EXPL	expletive
FOC	focus

FUT	future
GEN	genitive
GER	gerund(ive)
H	high (tone or pitch)
HON	honorific
HUM	humble
IMP	imperative
INCL	inclusive
IND	indicative
INDEF	indefinite
INF	infinitive
INS	instrumental
INT	intentional
INTERJEC	interjection
INTI	intimate
INTR	intransitive
IO	indirect object
IRR	irrealis
ITERA	iterative
k-irr	k-irregular (<i>ka-hen</i>)
L	low (tone or pitch)
LB	lower bigrade (<i>shimo nidan</i>)
LM	lower monograde (<i>shimo ichidan</i>)
LOC	locative
MPST	modal past
MVR	mid vowel raising
N	noun
n-irr	n-irregular (<i>na-hen</i>)
NCONJ	negative conjunctual
NEC	neccessitive
NEG	negative
NM	nominalization marker
NMLZ	nominalization/nominalizer
NMNL	nominal
NOM	nominative
NONPST	nonpast
NP	noun phrase
OBJ	object
OBL	oblique
OPT	optative
P	patient-like argument of canonical transitive verb, preposition, post-position

PART	particle
PASS	passive
PCONJ	present conjectural
PERF	perfective
PL	plural
POL	polite
POLCOP	polite copula
POSS	possessive
POTEN	potential
PP	prepositional/postpositional phrase
PRED	predicative
PRF	perfect
PRS	present
PRES	presumptive
PROG	progressive
PROH	prohibitive
PROV	provisional
PROX	proximal/proximate
PST	past
PSTCONJ	past conjectural
PTCP	participle
PURP	purposive
Q	question/question particle/question marker
QD	quadrigrade (<i>yodan</i>)
QUOT	quotative
r-irr	r-irregular (<i>ra-hen</i>)
REAL	realis
RECP	reciprocal
REFL	reflexive
RES	resultative
RESP	respect
S	single argument of canonical intransitive verb, sentence
SBJ	subject
SBJV	subjunctive
SFP	sentence final particle
SG	singular
SIMUL	simultaneous
s-irr	s-irregular (<i>sa-hen</i>)
SG	singular
SPON	spontaneous
SPST	simple past
STAT	stative

TOP	topic
TR	transitive
UB	upper bigrade (<i>kami-nidan</i>)
UNCERT	uncertain
UM	upper monograde (<i>kami-ichidan</i>)
V	verb, vowel
VN	verbal noun
VOC	vocative
VOL	volitional
VP	verb phrase

Languages

ConJ	contemporary Japanese
EMC	Early Middle Chinese
EMJ	Early Middle Japanese
EOJ	Eastern Old Japanese
J-Ch	Japano-Chinese
LMC	Late Middle Chinese
LMJ	Late Middle Japanese
JPN	Japanese
MC	Middle Chinese
MJ	Middle Japanese
MK	Middle Korean
ModJ	Modern Japanese
OC	Old Chinese
OJ	Old Japanese
pJ	proto-Japanese
pK	proto-Korean
SJ	Sino-Japanese
Skt	Sanskrit

Table of contents

Masayoshi Shibatani and Taro Kageyama

Preface — v

Masayoshi Shibatani and Taro Kageyama

Introduction to the Handbooks of Japanese Language and Linguistics — vii

Contributors — xxxviii

Masahiko Minami

Introduction: Japanese applied linguistics and this volume — 1

I First language (L1) acquisition/development

Tamiko Ogura and Toshiki Murase

- 1 The roles of cognitive bases and caregivers' speech in early language development — 17**

Etsuko Haryu

- 2 Literacy acquisition in Japanese children — 43**

II Second language (L2) acquisition/development and bilingualism/multilingualism

Yuko Goto Butler

- 3 Age factors in language acquisition — 67**

Kazuko Nakajima

- 4 Cross-lingual transfer from L1 to L2 among school-age children — 97**

III The teaching and learning of foreign languages

Kumiko Sakoda

- 5 Errors and learning strategies by learners of Japanese as a second language — 129**

Haruko Minegishi Cook

- 6 Adult L2 learners' acquisition of style shift: The *masu* and plain forms — 151**

Noriko Kobayashi

- 7 Japanese language proficiency assessment with the Simple Performance-Oriented Test (SPOT) as a primary focus — 175**

Kaoru Koyanagi

- 8 The role of instruction in acquiring Japanese as a second language — 199**

Masahiko Minami

- 9 The influence of topic choice on narrative proficiency by learners of Japanese as a foreign language — 223**

IV Corpus linguistics

Susanne Miyata and Brian MacWhinney

- 10 CHILDES for Japanese: Corpora, programs, perspectives — 255**

Jae-Ho Lee and Natsuko Nakagawa

- 11 KY corpus — 283**

Hiromi Ozeki

- 12 Corpus-based second language acquisition research — 313**

V Clinical linguistics

Kiyoshi Otomo

- 13 Assessment of language development in children with hearing impairment and language disorders — 337**

Manabu Oi and Sanae Tanaka

- 14 Revisiting autistic language: “Literalness” and “non-literalness” in Japanese children with autism — 367**

VI Translation

Judy Noguchi, Atsuko Misaki, Shoji Miyanaga, and Masako Terui

- 15 Towards a robust, genre-based translation model and its application — 385**

Yoko Hasegawa

- 16 Translation: A theoretical perspective — 415**

VII Sign languages

Daisuke Hara

17 Japanese Sign Language: An introduction — 443

Daisuke Hara

18 An information-based approach to the syllable formation of Japanese Sign Language — 457

Noriko Imazato

19 Syntax of Japanese Sign Language — 483

Takashi Torigoe

20 Sign language development and language input — 511

Subject index — 531

Contributors

Yuko Goto Butler is an associate professor of Educational Linguistics at the Graduate School of Education at the University of Pennsylvania. She is also director of the Teaching English to Speakers of Other Languages (TESOL) program at Penn. She received her Ph.D. in Educational Psychology from Stanford University. Her research interests are primarily focused on the improvement of second/foreign language education among young learners in the U.S. and Asia as well as assessment methods for them in response to the diverse needs of an increasingly globalizing world.

Haruko Minegishi Cook is a professor in the Department of East Asian Languages and Literatures at the University of Hawai'i at Manoa. Her main research interests include language socialization, discourse analysis, and pragmatics. She has published a number of articles on the Japanese sentence-final particles and honorifics in edited volumes and major journals. Her book on style shift in dinnertime conversation between learners of Japanese as a foreign language (JFL) and their host family was published in 2008 (*Multilingual Matters*), and her article on JFL learners' comprehension of style shift originally published in 2001 is included in *Pragmatics Reader* (Routledge) published in 2011.

Daisuke Hara completed his Ph.D. at the University of Chicago in 2003. He is a professor in the Department of Advanced Science and Technology at Toyota Technological Institute. He has been involved in sign language research for more than twenty years, and recently been interested in well-formedness of syllables and words of Japanese Sign Language (JSL). He has also been working on sentence-final pointing and its relation to subject and topic in a JSL sentence as well as signing systems used by non-native signers of JSL.

Etsuko Haryu completed her Ph.D. at the University of Tokyo. She is Associate Professor of Developmental Psychology in the School of Education at the University of Tokyo. She has mainly conducted experimental studies on children's language acquisition, especially focusing on their learning of words and letters. Her recent publications include "Object similarity bootstraps young children to action-based verb extension" (*Child Development* 82, 2011) and "Are higher-frequency sounds brighter in color and smaller in size? Auditory-visual correspondences in 10-month-old infants" (*Infant Behavior and Development* 35, 2012).

Yoko Hasegawa is Professor of Linguistics in the Department of East Asian Languages and Cultures at the University of California, Berkeley. Since her dissertation on Japanese clause linkage (UC Berkeley, 1992), she has worked on such aspects of Japanese linguistics as phonetics and phonology, syntax and semantics, pragmatics, and translation. Her recent publications include *Japanese: A Linguistic Introduction* (Cambridge University Press, 2014), *The Routledge Course in Japanese Translation*

(Routledge, 2011), *Soliloquy in Japanese and English* (John Benjamins, 2010), *Nihongo kara mita nihonjin: Shutaisei no gengogaku* 'Japanese People through the Japanese Language: Subjectivity in Language' (with Yukio Hirose, Kaitakusha, 2010).

Noriko Imazato is a professor in the Department of General Education at Kobe City College of Technology. Her research interests focus on semantics and syntax in Japanese Sign Language. Her latest publication is “Nihonshuwa ni okeru shugo/mokutekigo hyōji no jodōshi ni tsuite (Subject/Object marking auxiliaries in Japanese Sign Language)” in *Gengo Kenkyu* 146, 2014. She is also currently taking part in a collaborative project entitled “Compilation of Japanese Basic Verb Usage Handbook for JFL Learners” headed by Prashant Pardeshi at the National Institute for Japanese Language and Linguistics.

Noriko Kobayashi is a former professor of Japanese language pedagogy in the Graduate School of Humanities and Social Sciences at the University of Tsukuba. Her research interest ranges from Japanese linguistics to second language acquisition and language testing. She created several Japanese as a second language (JSL) textbooks, which are being used in many Japanese language courses. Her representative publications are: *Situational Functional Japanese*, co-authored with Tsukuba Language Group (Bonjinsha, 1991), “SPOT: A Test Measuring ‘Control’ Exercised by Learners of Japanese” co-authored with J. Ford-Niwa, in *The Acquisition of Japanese as a Second Language*, edited by Kanno (John Benjamins, 1999), *Japanese: A Comprehensive Grammar*, co-authored with S. Kaiser (Routledge, 2001).

Kaoru Koyanagi is Professor of Japanese and linguistics in the Center for Language Education and Research, and Graduate School of Languages and Linguistics at Sophia University. She completed her Ph.D. in applied linguistics at Georgetown University. Her research interests include language acquisition theories, cognitive mechanisms in language learning, and individual differences (in particular, language aptitude) in second language acquisition. She is the author of *Language Acquisition Theories for Teachers of Japanese* (3A Network, 2004) and “Second language acquisition (Chapter 3)” in *Dictionary of Japanese Language Pedagogy* (Kenkyusha, 2012).

Jae-Ho Lee is an associate professor of the Faculty of Humanities and Social Science at the University of Tsukuba in Japan. He obtained a Ph.D. in Linguistics at Kyoto University in 2008, and conducted research at the National Institute of Information and Communications Technology and The Japan Foundation in Japan before assuming his current position in 2011. His current research interests include a corpus-based study of Japanese and a methodology for e-learning. He has extensively published books such as *Corpus-Based analysis for Cognitive Syntax Research* (Hituzi Syobo, 2010), and *An Introduction to Corpus-Based Research for Japanese Language Education* (Kurosio Publishers, 2012).

Brian MacWhinney, Professor of Psychology, Computational Linguistics, and Modern Languages at Carnegie Mellon University, has developed a model of first and second language acquisition, processing, and disorders called the Competition Model. The model describes how language learning emerges from forces operating on lexically-based patterns across divergent timeframes. It has been tested through crosslinguistic experimentation, neuroimaging, online language learning, and analysis of data in the CHILDES, SLABank, BilingBank, and AphasiaBank open database systems that he has developed. His recent publications include *The Handbook of Language Emergence* (Wiley, 2015) and *Competing Motivations in Grammar and Usage* (Oxford, 2014).

Masahiko Minami, who received his doctorate from Harvard University, is a professor in the Department of Modern Languages and Literatures at San Francisco State University, where he specializes in Japanese language and cross-cultural studies. He also serves as an invited professor at the National Institute for Japanese Language and Linguistics based in Tokyo. He currently serves as Editor-in-Chief of the *Journal of Japanese Linguistics* and is also editing the current volume in the *Handbook of Japanese Language and Linguistics* series. His primary areas of interest in research are bilingual education and cross-cultural studies. He has written extensively on psycho/sociolinguistics with a particular emphasis on cross-cultural comparisons of language development and narrative/discourse structure. His recent work includes *Telling Stories in Two Languages: Multiple Approaches to Understanding English-Japanese Bilingual Children's Narratives* (Information Age Publishing, 2011).

Atsuko Misaki is an adjunct lecturer at Kinki University. Her current research interests include a genre-based approach to Japanese-to-English translation and English for Specific Purposes (ESP) in the fields of Japanese pop culture and arts. She received her master's degree in Teaching English to Speakers of Other Languages (TESOL) from Temple University, Japan (2008).

Shoji Miyanaga is a lecturer at the Faculty of Architecture of Kinki University. He received a Master of Science in Chemistry from Osaka City University and a Master of Science in Education from Temple University. He is currently pursuing a Ph.D. in Education. His research interests include English for Specific Purposes (ESP), translation, and second language writing. He has taught project-based English courses at the Colleges of Life Sciences and Pharmaceutical Sciences of Ritsumeikan University and ESP-oriented research article writing at the Department of Biology of the Graduate School of Science, Kobe University, as well as Japanese-to-English translation at Simul Academy.

Susanne Miyata is a professor in the Communication Disorders and Science Course of the Faculty of Health and Medical Sciences at Aichi Shukutoku University in Nagoya, Japan. Her research focuses on early Japanese language acquisition, and the development of analysis tools for large speech corpora in the framework of

CHILDES/TalkBank. She manages the Japanese website of CHILDES (CHILDES *Nihongoban*), and assists researchers preparing Japanese speech data for database publication. Her recent publications include *Developmental Sentence Scoring for Japanese (DSSJ)* (*First Language* 33, 2013) and *Kotoba Ejiten* [Picture Word Lexicon] (Gakken, 2013).

Toshiki Murase is Professor of Psychology at Shimane University. His research interests are the cognitive basis of language development, the characteristics in parental speech, and the effects of the input language on children's language and cognitive development. He has conducted comparative studies on parent-child conversation ("Mother-child conversation during joint picture book reading in Japan and the USA" in *First Language* 25(2), 2005) and infant-directed speech (IDS) by Japanese caregivers ("Caregivers' speech" in *the Handbook of East Asian Psycholinguistics: Vol. 2, Japanese*, edited by M. Nakayama, R. Mazuka, Y. Shirai, Cambridge University Press, 2006).

Natsuko Nakagawa, who specializes in linguistics and language teaching, is a research fellow of the Japan Society for the Promotion of Science and Chiba University. She completed her master's degree at Kyoto University and State University of New York at Buffalo. Her primary interests are information structure and its interfaces with prosody, word order, and particles in Japanese and Ryukyuan languages from typological and psycholinguistic perspectives, especially by organizing, annotating, and analyzing spoken corpora. She also taught Japanese at SUNY Buffalo and Doshisha University. Her publications include book chapters on introductory Japanese sounds and grammar.

Kazuko Nakajima is a professor emerita of the Department of East Asian Studies of the University of Toronto. She also taught at Nagoya University of Foreign Studies while serving as the director of the Japanese Language Institute. Her research interests include bilingualism/multilingualism and heritage/ minority language education. She was the founding president of the Canadian Association for Japanese Language Education, 1988-1998, and the Mother Tongue, Heritage Language, Bilingual Education (MHB) Research Association, 2003-2013. Her major publications include *Bairingarū Kyōiku no Hōhō* (Methodologies of Bilingual Education) (ALC, 1998, 2002, 2015), and *Maruchiringarū Kyōiku e no Shōtai* [An Invitation to Multilingual Education] (Hituzi Syobo, 2010).

Judy Noguchi is Dean and Professor of English at the Faculty of Global Communication of Kobe Gakuin University. She has been involved in developing and teaching English for Specific Purposes (ESP) courses and materials for students in pharmacy, medicine, science, and engineering. She has also contributed "Exploring an ESP Approach to Literature" to *Bungaku kyōzai jissen handbook – eigo kyōiku o kasseika suru* (in Japanese) (Materials for teaching literature: To activate English teaching) (2013, Eihosha) and "Secondary English education in Japan: An overview and a

preview” to *Secondary School English Education in Asia: From Policy to Practice* edited by Bernard Spolsky and Kiwan Sung (2015, Routledge).

Tamiko Ogura obtained her Ph.D. in Psychology from Kyoto University in 1993. She taught developmental psychology and developmental disorders at Shimane University, Kobe University, and Tezukayama University before moving to the graduate school of Osaka University of Comprehensive Children Education in 2015. She is also Professor Emerita at Kobe University. Her research interests are the process of language development in typically developing monolingual children, and the cognitive bases for language development and caretaker’s input. Her major research includes “The use of nouns and verbs by Japanese children and their caregivers in book-reading and toy-playing contexts,” which appeared in the *Journal of Child Language* 33(1) (2006). She also developed the Japanese version of the MacArthur-Bates Communicative Inventories.

Manabu Oi is Professor of Communication Disorders at Kanazawa University. His research has been concerned with pragmatic disability in children with intellectual disabilities or autism. His recent work has focused on the comprehension of figurative language in children with autism (“Comprehension of figurative language in Taiwanese children with autism: The role of theory of mind and receptive vocabulary” in *Clinical Linguistics & Phonetics*, vol. 29, early online 1-12, 2015). He is a member of editorial board of *Child Language Teaching & Therapy*. He was past president of Japanese Association of Communication Disorders.

Kiyoshi Otomo is a professor at the Center for the Research and Support of Educational Practice of Tokyo Gakugei University in Japan. He is President of the Japanese Association of Communication Disorders and an executive board member of the Japanese Association for the Study of Developmental Disabilities. His research focuses on assessment of and intervention in the speech and language of children with developmental disabilities. He has developed language assessment scales for young and school-age children learning Japanese as the first language, the Language and Communication Developmental Scale (2013) and the Language and Communication Development Scale for School-Age Children (2012).

Hiromi Ozeki completed her Ph.D. at Ochanomizu University in 2005. She is currently an associate professor in the Faculty of Foreign Studies and Graduate School of Language Education at Reitaku University. Her research interests focus on the acquisition of Japanese noun-modifying clauses by first and second language learners. Her publications include “Does the noun phrase accessibility hierarchy predict the difficulty order in the acquisition of Japanese relative clauses?” (with Yasuhiro Shirai, *Studies in Second Language Acquisition* 29, 2007). She recently edited *Fiidobakku kenkyū eno shōtai* [An Introduction to Feedback Research] (Kuroosio Publishers, 2015).

Kumiko Sakoda completed her Ph.D. at Hiroshima University in 1996. She taught courses on teaching Japanese as a second language and language acquisition study at Hiroshima before moving to the National Institute for Japanese Language and Linguistics as a professor in 2012. Her research interests focus on grammar acquisition of Japanese as a second language (L2) in different learning environments. Her recent publications include “*Hi-bogowasha no Nihongo-komyunikēshon no kufū* [Strategies of non-native speakers of Japanese in communication]” in *Nihongo kyōiku no tamenō komyunikēshon kenkyū* [Communication studies for Japanese language education] (Kurosio Publishers, 2012).

Sanae Tanaka is a research associate at the Research Center of Child Mental Development, Kanazawa University. She has participated in developing and studying communication interventions with children who have high-functioning autism spectrum disorders or learning disabilities. In recent years, she has assisted Manabu Oi in his investigation of figurative language comprehension by children with autism (“The Relationship between Comprehension of Figurative Language by Japanese Children with High Functioning Autism Spectrum Disorders and College Freshmen’s Assessment of Its Conventionality of Usage” in *Autism Research & Treatment*, vol. 2013, Article ID 480635, 7 pages, <http://dx.doi.org/10.1155/>

Masako Terui is a lecturer at Kinki University and a part-time lecturer at the Graduate School of Engineering, Kobe University. Her research interests focus on English for Specific Purposes (ESP), especially on science and engineering as well as business. She completed her Ph.D. at Osaka University in 2011. She has given ESP classes at Mukogawa Women’s University (pharmaceutical sciences and business communication), National Tax College (taxation), and the Graduate School of Engineering, Kansai University (bioscience). Her recent publications include *Essential English for Business Meetings* (Asahi Press, 2015) and *Professor Judy’s Lectures for Successful Science Presentations* (Kodansha, 2014).

Takashi Torigoe is a professor in the Department of Special Needs Education at Hyogo University of Teacher Education. His research interests focus on sign language acquisition by deaf children and the use of signed language in education of the deaf. His publications include “Japanese Sign Language” in *the Handbook of East Asian Psycholinguistics: Vol. 2, Japanese* (edited by M. Nakayama, R. Mazuka, Y. Shirai, Cambridge University Press, 2006), “Deaf education and bilingualism: Signed and spoken languages” (*Studies in Language Sciences* 3, 2004), and “A descriptive analysis of pointing and oral movements in a home sign system” (with Wataru Takei, *Sign Language Studies* 2, 2002).

Masahiko Minami

Introduction: Japanese applied linguistics and this volume

1 Introduction

Today's applied linguistics addresses crosscurrents not only in linguistics and education (e.g., language acquisition, literacy, bilingualism, and multilingualism), but also in psychology, anthropology, sociology, and even computer science. Many people may associate applied linguistics with the study of foreign/second language learning and teaching. While the teaching and learning of foreign/second languages is certainly the primary or most developed branch in applied linguistics, this interpretation is quite narrow and, in fact, reveals a traditional, parochial view toward the discipline. Instead, we should adopt an emerging much broader definition, i.e., the study of language and linguistics in relation to practical problems as occurring in such diverse areas as translation and speech pathology. The organizing theme, therefore, of the *Handbook of Japanese Applied Linguistics* is the interconnection among diverse areas within the major framework of applied linguistics.

2 Brief explanation of the importance of this volume

Language has the structure and properties necessary to satisfy the functions it is supposed to serve. If we wish to understand those functions, we should not be in awe of disciplinary boundaries. A variety of issues have been appropriated for study by a wide array of disciplines, ranging from philosophy and linguistics to anthropology, psychology, and sociology. However, we sometimes face the reality that many issues raised and discussed in those disciplines are only arbitrarily categorized into them.

The *Handbook of Japanese Applied Linguistics* reflects crosscurrents in applied linguistics, an ever-developing branch/discipline of linguistics. To begin with, applied linguistics is the study of language that identifies, investigates, and tries to offer possible solutions to language-related real-life issues. Broadly defined in this way, however, applied linguistics is a vast interdisciplinary field. The primary concern of the discipline centers on the application of linguistic theories, methods, and findings in phonology, morphology, syntax, and semantics to the explanation of language issues observed in other disciplines or fields.

The current volume is important because applied linguistics is the best single label to represent a wide range of contemporary research at the intersection of

linguistics, anthropology, psychology, and sociology, to name but a few. The application or even expansion of applied linguistics to other fields, as a matter of fact, has been particularly noteworthy in the past several decades. Take educational linguistics, for example. One of the aims of the current volume is not only to examine the teaching and learning of foreign languages, but also to visit the use of language in mother-tongue education. Likewise, this volume, in connection with neural linguistics, includes issues related to clinical linguistics, i.e., linguistic analysis of language disorders. The volume further includes developments in corpus linguistics,¹ translation, and sign languages. Without discussing these issues, the consideration of the intrinsic question of how humans learn a language, for instance, would be virtually impossible, and an analysis of daily conversation would be practically meaningless. In other words, language shapes and is shaped by diverse sociocultural experiences, and applied linguistics is related to those experiences.

The purpose of this volume is to cover cutting-edge work in the field of applied linguistics. As mentioned earlier, in accordance with today's definition of applied linguistics, the volume reflects the elucidation of language problems as a result of interdisciplinary studies. The boundary between applied linguistics and other branches of linguistics, such as sociolinguistics and psycholinguistics, has become increasingly indistinguishable. Furthermore, in order to develop its own theoretical models of language and language use, applied linguistics deploys information even from sociology, psychology, and cultural anthropology. While such disciplines as linguistics and psychology develop their own theoretical foundations, applied linguistics (or, in this case, applied psycholinguistics, to be more precise) can be characterized as being broader and much more practical. In this way, the distinction between *micro* (or theoretical) and *macro* (or practical) views of language phenomena is apparent, and the parts and chapters included in this volume deal with issues from various *macro* points of view, which hold significant meaning as our world becomes increasingly more culturally complex and pluralistic. Therefore, the goal of the volume is to provide current and cumulative information in applied linguistics, in a clear and concise manner that is meaningful to researchers in various fields for future exploration.

As applied linguistics regarded as a sub-discipline of linguistics has changed, evolved, and even expanded since the mid-twentieth century, the number and variety of its areas of study have steadily increased. One may argue potential overlaps with the psycholinguistics volume, another volume of this series of the *Handbook of Japanese Language and Linguistics*. The psycholinguistics volume shows language as a complex (cognitive/grammatical) system acquired by the brain with some innate and learned/developed aspects. On the other hand, this applied linguistics

¹ Corpus linguistics is the study of language and a method of linguistic analysis that uses a large and structured set of real-world texts, which are known as corpora.

volume looks at language acquisition from more sociocultural perspectives, i.e., language as a means of communication and as a social behavioral system. In other words, the psycholinguistics volume tries to describe language as an activity of the brain. On the other hand, the applied linguistics volume attempts to explain first language (L1), second language (L2), and foreign language education from the perspectives of language socialization (i.e., the process whereby children and novices are socialized through language) and sociocognitive theory, which emphasizes pragmatic development as one of the central activities as the L1 and L2 use and overall language/human development.

3 Structure of the volume and rationale for that structure

One important objective of the *Handbook of Japanese Applied Linguistics* is to bring to the fore new directions and methodological advances in Japanese applied linguistics. This volume explores a variety of language issues related to the aforementioned disciplines/fields within the framework of applied linguistics. The volume, which is divided into seven major parts with twenty chapters, is organized as follows: Part I discusses L1 acquisition/development, whereas Part II covers issues related to L2 acquisition/development and bilingualism/multilingualism. Part III presents problems associated with the teaching and learning of foreign languages. Parts IV through VII of this volume examine four “ostensibly” different areas, all of which have attracted a great deal of attention in recent years. Specifically, Part IV undertakes questions in corpus linguistics. Part V deals with clinical linguistics, and Part VI takes up concerns in the area of translation/interpretation. Finally, Part VII discusses Japanese Sign Language.

3.1 Part I: First language (L1) acquisition/development

First language acquisition and the development of first-language literacy skills are a natural starting point for the thematic organization in the *Handbook of Japanese Applied Linguistics*. Indeed, this is the theme of the two chapters that form Part I, which, at least in part, deals with the so-called language continuum. In the past, spoken language and written language were considered separate and distinctly different skills. Recent research, however, has focused on a possible continuum of these two language skills for each individual child; that is, literacy skills are built upon the oral language acquired in infancy and the first several years of life. In other words, early oral language proficiency possibly relates to the later acquisition of reading and writing.

In any society, a child's life is driven in part by particular models of what parents believe to be the good life and the ideal individual. In this sense, Tamiko Ogura and Toshiki Murase – Chapter 1: “The roles of cognitive bases and caregivers’ speech in early language development” – focus not only on the cognitive bases of language acquisition, but they also examine language socialization. As the authors point out, by acquiring linguistic knowledge, which is immersed in sociocultural pathways, children become socialized through language. Ogura and Murase believe that language acquisition is not simply the manifestation of the development of the language module itself. Instead, from their longitudinal study of development from babyhood to toddlerhood, they claim to have identified how different nonlinguistic domains are associated with the development of vocabulary comprehension and production. According to Ogura and Murase, sensitivity to social signals accelerates the acquisition of language because a developmental link exists between conceptual comprehension, fluent imitation skills with the use of objects, and linguistic comprehension. Motor skills, such as manipulation, substitution play, feeding, and vocal imitation, are also closely related to verbal production. While Ogura and Murase acknowledge that cognitive systems are universal, they also emphasize the effect of maternal input. According to these two researchers, comparative studies between Japanese and North American mothers have revealed that Japanese mothers are more affection- or empathy-oriented whereas North American mothers are more information-oriented. To support their argument about the effect of social interaction, Ogura and Murase review cross-cultural/cross-linguistic empirical data as well as experimental research findings, particularly focusing on the use of child-directed speech (i.e., maternal utterances, the speech register used with young children, also known as motherese or baby talk, which is sometimes used to refer to the speech of young children as well).

Etsuko Haryu – Chapter 2: “Literacy acquisition in Japanese children” – discusses Japanese-speaking children's literacy acquisition process. The Japanese writing system uses three types of characters, two different *kana* syllabaries (*hiragana* and *katakana*) and Chinese characters (*kanji*). Haryu's chapter focuses mainly on children's acquisition of *hiragana*, which children learn before they learn *kanji*. With a brief description of the structure of Japanese orthography, the chapter describes: (1) how transition takes place from oral language skills (i.e., orality) to written language skills (i.e., literacy), which is illustrated by how children learn to read *hiragana*, (2) how phonological awareness is reflected in children's *hiragana* acquisition process, (3) what kind of sociocultural context is observed that guides children to learn to read *hiragana*, and, most importantly, as byproducts of using written language, (4a) how abilities to comprehend and tell – there and then – stories, which are not about “here and now”, develop and (4b) how children learn symbolic values in Japanese onomatopoeia (e.g., voiced/voiceless consonants are used to describe loud/quiet sounds from big/small objects in Japanese onomatopoeia). Paying particular attention to the sociocultural context in which children learn how to read and write,

Haryu's chapter examines the overall transition process from oral language skills to written language skills.

3.2 Part II: Second language (L2) acquisition/development and bilingualism/multilingualism

Part II, which brings together contributions that delve into L2 acquisition and bilingualism, also deals with another possible continuum, a relationship between L1 and L2. The transition here reflects the overall question: If an individual who has acquired a certain paradigm for communication in one culture is thrown into another culture, what happens? The transition from the L1 to an L2, as a matter of fact, illustrates an extreme example. Even within the L1 framework, individuals (particularly, children in this case) experience a series of transitions. From babyhood on, an individual is socialized in culturally specific ways, with the primary agent of socialization being the family. However, once an individual has started schooling, which is widespread in modern societies, the main agent of socialization changes from the primary speech community, namely, the family and local community where the individual was raised, to the secondary speech community, namely, the school, in which the individual's discourse style and subsequent literacy practices are often reshaped. A stronger restatement of this problem, which inquires whether or not a language continuum exists, suggests that the habitual way of communicating learned in one cultural setting (either home or, more broadly, an L1 context) might not necessarily function appropriately in a new setting (such as school or an L2 environment).

To examine the aforementioned transition, one needs to examine multiple issues, such as individual differences and possible language transfer. First, age has been considered to be one of the major factors that explain individual differences in language acquisition among bilinguals and multilinguals. While numerous studies have investigated the relationship between age and language acquisition/learning, many questions still remain unanswered. One of these unresolved questions derives from the critical period hypothesis, which claims the existence of a limited time period in an individual's development during which native-like language attainment is possible. The hypothesis has stirred heated debate among scholars in different academic disciplines, ranging from linguistics and psychology to neuroscience. Yuko Goto Butler – Chapter 3: “Age factors in language acquisition” – focuses on whether a critical period exists in language acquisition. She discusses the conceptual and methodological issues as well as the challenges that have arisen in previous studies, and offers suggestions for future research.

Second, the term *common underlying proficiency* (CUP) has been used to refer to the cognitive/academic proficiency that underlies academic performance in both L1 and L2 (Cummins 1991a, 1991b). Ever since Jim Cummins proposed CUP and linguistic interdependence across languages (Cummins 1979), cross-lingual transfer

has been conceived as something expected to happen naturally and automatically over time, mainly in literacy-related language domains. Thirty plus years later, however, the landscape has dramatically changed, according to Kazuko Nakajima – Chapter 4: “Cross-lingual transfer from L1 to L2 among school-age children”. Nakajima claims that teaching for transferring literacy skills from the L1 to an L2 is now considered worth promoting vigorously in schools through the integrated bilingual instructional approach. In her chapter, with empirical findings both in Japan and abroad on various aspects of language proficiency, Nakajima reexamines the theoretical background of cross-linguistic influence on language learning.

Given a vast array of situations in which one acquires/learns language, either the L1 or an L2, it would be a very challenging task to cover all relevant topics in Parts I and II. While there may be gaps in coverage, important issues are dealt with as much as possible in other parts as well. A way of looking at language acquisition is such an example. Over the last few decades, the field of L2 research has grown dramatically [see Bialystok (2001) for review]. Theoretical approaches are numerous and are often linked to very different interests. Some were born out of an interest in the relationship between language and society and how this affects acquisition. Some try to explain acquisition from a functional perspective, a cognitive perspective, and yet others examine the availability of a language acquisition device (in the UG sense²) to the L2 learner. Parts I and II serve to make explicit the framework in which the contributors to this volume operate, to introduce some common terminology and definitions, and to give the reader a sneak preview of the chapters to follow in other parts.

3.3 Part III: The teaching and learning of foreign languages

Part III presents chapters that focus on second/foreign language learning. This is a traditional area for applied linguistics. As stated earlier, the *Handbook of Japanese Applied Linguistics* represents another step advancing a shift from the traditional view of applied linguistics to more diverse areas. Accordingly, the chapters in Part III point to further developments in this direction. Specifically, the issues in foreign language education discussed in Part III can also be conceptualized as a potential conflict between two differing speech communities. The underlying questions for the first three parts can therefore be summarized as follows: (1) How do individuals define themselves in and through language? (2) How do communities differ in their

² Universal grammar (UG), a linguistic theory popularized by Noam Chomsky in the 1950s and 1960s, is based on a claim that the ability to learn grammar is hard-wired into the brain (Chomsky 1957, 1965). Centering on the so-called “poverty of the stimulus” argument, the theory suggests: (1) linguistic abilities are innate, and (2) regardless of differences in surface features, all human languages are built upon common properties.

ways of speaking and how do individuals accommodate when they are placed in different speech communities?

The focus of research not only in L1 acquisition but also in L2 acquisition/learning has, in fact, shifted to the issue of how language is used in various social contexts. Part III includes five chapters reflecting this trend. Examining various types of errors made by learners of Japanese as an L2, Kumiko Sakoda – Chapter 5: “Errors and learning strategies by learners of Japanese as a second language” – identifies how their language systems and their rules operate and examines how they differ from the ones that teachers teach and from those of native speakers. Sakoda specifically examines the following: (1) differences in L2 acquisition between two different settings, namely, acquisition as a result of classroom instruction and acquisition as a result of natural interactions; (2) the acquisition process in different environments, namely, the difference between Japanese-as-a-second-language, which primarily takes place in Japan (where the target language is used in daily interactions), and Japanese-as-a-foreign-language (JFL), which generally takes place in a learner’s country (where the target language is not necessarily used in daily interactions); (3) the effect of language transfer (with a particular focus on grammatical rules). Using both longitudinal and cross-sectional orally gathered data, Sakoda provides an account of how language-learning strategies work as a system.

Compared to Japanese language textbooks’ descriptions of the *masu* form (i.e., a polite way of speaking) and the plain form, actual usage of these two forms is much more complex. Thus, learning appropriate uses of these forms is not easy for JFL learners. Haruko Minegishi Cook – Chapter 6: “Adult L2 learners’ acquisition of style shift: The *masu* and plain forms” – first reviews recent research on adult JFL learners’ acquisition of the *masu* and plain forms. Cook then develops her discussions by using intermediate-level American JFL learners’ acquisition of style shift in the context of a homestay experience.

Responding to the necessity of some kind of assessment in order to monitor Japanese-language learners’ progress, Noriko Kobayashi – Chapter 7: “Japanese language proficiency assessment with the Simple Performance-Oriented Test (SPOT) as a primary focus” – examines how to assess L2 learners’ proficiency. To begin with, the purpose of assessing foreign language proficiency is to demonstrate/determine learners’ language abilities in actual use within their target language domains. The assessment is in reference to established criteria, and the rating is made according to its goal. Kobayashi reviews key features of existing proficiency tests, such as the Japanese Language Proficiency Test (JLPT), from the viewpoint of test validity, rating method, and scale descriptions. She introduces the Simple Performance-Oriented Test (SPOT), which has been developed based on a cognitive theory of language processing in order to measure Japanese language proficiency in an indirect way. Kobayashi focuses on the authenticity and the value/utility of SPOT in various language tests.

Instructed L2 acquisition research suggests that, in order to promote language acquisition, learners' attention should occasionally be shifted to a certain form during meaningful communicative activities. Instruction can provide opportunities for focus on form, i.e., simultaneous processing of form and meaning/function that is supposed to facilitate further learning. Kaoru Koyanagi – Chapter 8: “The role of instruction in acquiring Japanese as a second language” – explores the effect of focus-on-form instruction, such as negative feedback and output practice on the acquisition of Japanese as an L2, and discusses how instruction could enhance acquisition processes. Since the impact of instruction is mediated by grammatical difficulty and learners' variables (e.g., language aptitude), Koyanagi also explores these issues in her chapter.

One should keep in mind that proficiency is contextual, and using the task of narration may suggest such limitations. Implementation of newer theories of L2 acquisition, such as those derived from discourse analysis and those focusing on social variables, has helped language instructors develop more effective teaching methods than the explicit/strict grammar and vocabulary approach used in traditional foreign-language classrooms. Language learners' difficulties in conveying their messages in the target language, however, also seem to be related to a lack of interactional/communicative competence. For instance, despite the emphasis on communicative competence in their Japanese language curriculum, producing extended discourse like oral narratives has been a challenge for adult learners of Japanese. Studying L2 learners' narrative productions thus holds significant meaning. Examining aspects of two disciplines – (1) L2 acquisition and (2) narrative discourse, Masahiko Minami – Chapter 9: “The influence of topic choice on narrative proficiency by learners of Japanese as a foreign language” – investigates the personal narratives³ of adult learners of Japanese. This is done in order to track some specific characteristics in the development of narrative skills as well as to determine ways in which L2 learners become able to utilize narrative devices effectively.

3.4 Part IV: Corpus linguistics

Corpus, or a collection of linguistic data, plays an increasingly important role by serving as a means of verifying hypotheses about a language. Reflecting the emergent diversity of the field, Part IV consists of three chapters that discuss issues

³ For over forty years a great number of researchers have applied Labovian methodology (Labov 1972) to various types of personal narratives. Minami's chapter included in this volume is one of them. We should, however, be simultaneously cognizant of the fact that storytelling is a joint narrative production or co-construction of interactional exchanges (Schegloff 1997). In this regard, the Labovian model has been considered to be unsatisfactory or even criticized particularly by the proponents of interactional linguistics (e.g., Ochs, Schegloff, and Thompson 1996) in the 1990s. Chapter 6, “Narrative development in L1 Japanese” by Minami, in the *Handbook of Japanese Psycholinguistics* (edited by Mineharu Nakayama) points to further development as narrative as a form of an interactional achievement or collaboration.

related to corpus linguistics. The part starts with CHILDES, an acronym for the **Child Language Data Exchange System**. The CHILDES Project was developed by Brian MacWhinney of Carnegie Mellon University and Catherine Snow of Harvard University, as a repository for child and adult language (MacWhinney 2000; MacWhinney and Snow 1985, 1990). The project has made it possible to automate the analysis of language samples. Susanne Miyata and Brian MacWhinney – Chapter 10: “CHILDES for Japanese: Corpora, programs, perspectives” – review the development of CHILDES in the area of the Japanese language. They describe the beginnings of CHILDES in Japan and its remarkable influence on Japanese language development research. Since CHILDES was introduced to Japan in the early 1990s, a variety of Japanese corpora, such as longitudinal child data, bilingual data, narratives, mother-child interactions, and adult-adult conversations, have been added to the database. While the early years were dominated by the development of a transcription system that was well suited to the Japanese language, in subsequent years a number of analysis programs have been developed specifically for Japanese. Today the rich annotation system of CHILDES, combined with the language specific morpho-syntactical tags and English translation tags, as well as the increased use of audio and video technology, allows a multifaceted analysis of Japanese corpora.

Part IV then introduces specific corpus data. In Chapter 11, Jae-Ho Lee and Natsuko Nakagawa introduce the Kamada and Yamauchi (KY) corpus (chapter title: “KY corpus”) as an example of learner corpora and discuss it from the following three perspectives: (1) By positioning the KY corpus as a language resource, they provide an overview of the corpus with quantitative information including its basic design and size. (2) By positioning the KY corpus as a resource for L2 acquisition research, they review how it has been used in previous studies. They specifically discuss how the KY corpus has played a role in error analysis and interlanguage⁴ analysis of Japanese. (3) They discuss the potential of the KY corpus from the viewpoint of application. They particularly explore how the KY corpus can be applied to the development of educational materials and language tests of Japanese, along with discussion of future prospects for the corpus.

According to Hiromi Ozeki – Chapter 12: “Corpus-based second language acquisition research” – learner corpora provide a very rich source of data that can be obtained only from actual language use. However, because corpora have various limitations, one must accept the fact that there are various aspects of L1 and L2 acquisition that cannot be uncovered by simply using corpus data. Using learner corpus data on L2 acquisition of Japanese, Ozeki reviews previously existing research studies. She then compares those data with L2 acquisition of English and other languages as well as L1 acquisition, and discusses what can and cannot be

⁴ Interlanguage is the term coined by Selinker (1972) to indicate the type of language produced by L2 learners. The term refers to the systematic knowledge of an L2 that is possibly independent of both the learner’s L1 and the target language.

found through the analysis of learner corpus data. Finally, she considers (1) how we should use learner corpora to investigate the developmental process of inter-language and (2) how we can make theoretical contributions to the field of second language acquisition using learner corpora.

3.5 Part V: Clinical linguistics

Not all children acquire language easily or well. Clinical linguistics in Part V deals with the application of linguistic theories, methods, and findings to the analysis of medical conditions related to language disorders. Encompassing two chapters, this part examines some major causes and patterns of language delay and disorder in children.

Human communication can be conceptualized as consisting of three broad domains: speech, language, and communication. After introducing the definition of each domain, Kiyoshi Otomo – Chapter 13: “Assessment of language development in children with hearing impairment and language disorders” – focuses largely on language domain disorders, and discusses procedures to assess language-related skills. In capturing the characteristics of language delays associated with hearing impairment and language disorders, Otomo examines children’s skills in the following areas: (1) basic communication, such as joint attention/engagement and requesting behavior, (2) vocabulary, (3) word combination and syntax, and (4) discourse. Otomo offers key findings of the developmental process in these areas in children with hearing impairment and language disorders, such as specific language impairment and language disorders associated with mild intellectual impairment. Reviewing various tools for language assessment developed for the Japanese language, Otomo also discusses the procedures to assess language related skills.

The next issue dealt with in Part V is literalness, which is defined as being in accordance with, conforming to, or upholding the exact or primary meaning of a word or words. Manabu Oi and Sanae Tanaka – Chapter 14: “Revisiting autistic language: ‘Literalness’ and ‘non-literalness’ in Japanese children with autism” – examine the language of autistic children in detail in an attempt to ascertain whether their communicative difficulties stem from relationships between language and understanding of others, themselves, and the world itself in autism. According to Oi and Tanaka, it has been long believed that literalness is the most prominent characteristic of language in individuals with autism since the disorder was first proposed by Leo Kanner in 1943 and Hans Asperger in 1944. Oi and Tanaka acknowledge that few researchers have doubted this claim, despite the fact that there have been a few research findings suggesting that autistic language is not always literal. Indeed, it has been believed that Japanese children with high-functioning Autistic Spectrum Disorder (HFASD) correctly comprehend almost all uses of ambiguous language such as in metaphor, irony, sarcasm, and indirect requests – at least when

they hear a third party using these modes of speech. Furthermore, they seem to learn the meaning of ambiguous language when they hear it for the first time. On the other hand, when they are addressed directly, these HFASD children interpret ambiguous language forms literally. These facts may challenge the generally held belief about the comprehension of ambiguous language in autism, i.e., the belief that in any situation children comprehend ambiguous language nonliterally. Oi and Tanaka thus emphasize the necessity of constructing a highly valid method for evaluating literal comprehension of autistic children.

3.6 Part VI: Translation

Like Part IV (corpus linguistics), issues discussed in Part VI may be viewed, at least on the surface, as simply taking up technical matters. In reality, however, they are not. Genre-based translation clarifies some of the most important issues that translators have to face when dealing with the translation of texts. Judy Noguchi, Atsuko Misaki, Shoji Miyanaga, and Masako Terui – Chapter 15: “Towards a robust, genre-based translation model and its application” – first develop a new model of genre-based translation and then describe how this model was tested in a translator-training program in Japan. Many approaches to translation exist, but Noguchi et al. claim that none have seriously applied a genre-based approach employing concepts and tools from work in systemic functional grammar, an approach to studying grammar based on the purpose of grammatical elements that was originated by Michael Halliday, and in English for specific purposes (ESP). Noguchi et al. maintain that such a model can help resolve word choice, register, and rhetorical issues that appear in translation, especially between languages such as Japanese and English, where there is considerable linguistic distance. The ESP model of translation raises awareness of the language features of both source and target texts as well as of their discourse community environments. It employs analysis and deconstruction of texts, in order to identify rhetorical structures and also uses dedicated corpora to select suitable terminology and phrasing for the target texts. When applied, the model can lead to diachronic (over time) development of genre awareness to lay the basis for continued and autonomous improvement of translation skills and thus the production of better target texts. In this way, Noguchi et al. carefully deal with issues associated with translation in particular, focusing on the development of a translation model on the one hand and the application of this model to an actual situation on the other. In other words, the second half of their chapter illustrates an example of how the theory reviewed in the first half can actually be applied.

Likewise, Yoko Hasegawa – Chapter 16: “Translation: A theoretical perspective” – presents a comprehensive overview of the theoretical study of translation in general, such as premodern translation theories, mid-twentieth century translation theories, Skopos theory, the negative analytic, and recent considerations concerning translation practice (e.g., establishment of a literary canon). Overall, translation is a

complex task requiring near native-speaker knowledge of the source and target languages. In countries where the target language is not commonly used (e.g., an environment where English is a foreign language) such as Japan, acquiring such knowledge is a challenging undertaking, and, in this sense as well, issues discussed in Part VI hold significant meaning.

3.7 Part VII: Sign languages

Part VII has a separate introductory chapter and deals with issues associated with sign languages, which are natural languages that have developed in deaf communities. The part is preceded by a short introduction by Daisuke Hara – Chapter 17: “Japanese Sign Language: An introduction” – in which he provides an overview of Japanese Sign Language (JSL),⁵ a natural language phylogenetically independent from Japanese, covering both historical developments and overall linguistic features, as well as other contemporary issues including the current research scenes. Hara also discusses the differences between JSL and the manually represented Japanese, the so-called Signed Japanese, as well as the use of the two signed languages. He also explores the relationship between JSL and other sign languages, such as American Sign Language (ASL).

In Chapter 18: “An information-based approach to the syllable formation of Japanese Sign Language”, Hara first examines how JSL conforms to early findings from ASL, focusing on the work of William Stokoe, the founding father of sign linguistics. Hara then examines the applicability of phonological methods for oral languages to the study of sign languages. In the field of ASL phonotactics (a branch of phonology mainly concerned with the analysis and description of permissible sound sequences within a language), it is well known that when two hands are involved in word formation, strict constraints are imposed on the nondominant hand. Hara considers to what extent these restrictions apply to JSL. His discussions include a recalcitrant problem concerning phoneme sequences, where certain combinations of two phonemes are allowed in some situations but not in others, especially in two-handed words. With regard to JSL morphology, Hara pays particular attention to (1) the morphemes that are simultaneously, not sequentially, combined with stems, (2) the morphology of a certain type of verb that is inflected for some properties (e.g., person and number) of subject and/or object and also for some aspects, and (3) those morphemes suprasegmentally realized by eyebrow raising, head nodding, lean of the body, and/or other non-manual elements performing certain grammatical functions.

⁵ Note that researchers outside Japanese Sign Language, particularly in the field of foreign/second language studies, use the abbreviation JSL for “Japanese as a Second Language” instead of “Japanese Sign Language” (see Chapters 4, 5, 6, 7, 8, 11, 12, and 13 in this volume, for instance).

Noriko Imazato – Chapter 19: “Syntax of Japanese Sign Language” – first reviews the achievements and limitations in the syntactic studies of JSL, comparing them, where appropriate, with those seen in the studies of ASL. She then explores the functions of pointing in the signing space and facial expressions and their use as grammatical markers, as observed in sign languages all over the world. As in spoken languages, grammaticalization of these elements is widely seen in JSL as well. By examining a large number of JSL motion expressions, Imazato describes and analyzes the pattern of grammaticalization of motion verbs and explores the fundamental question of “What facilitates grammaticalization?”

Takashi Torigoe – Chapter 20: “Sign language development and language input” – reviews recent research on Sign Language development and its environmental aspects. According to Torigoe, (1) research shows that general developmental patterns are shared between signed and spoken languages, despite their different modalities; (2) it has also been found that pointing gestures and facial expressions, both of which are used as linguistic components in Sign Language, are acquired in developmental processes as such, although they are used pre-linguistically at first. Torigoe particularly emphasizes the need for further research on the input of Sign Language, the home sign, and signing bilingualism, because findings in these areas can potentially explain the general language acquisition process of human beings. In other words, Torigoe pays particular attention to marked similarities in the courses of Sign Language and oral language development. And, we realize that we go back to the issues related to the L1 discussed earlier in Part I.

Overall, the issues that arise in the seven major parts of the *Handbook of Japanese Applied Linguistics* are theoretical and methodological on the one hand, but practical on the other. Yet the twenty chapters in these parts reflect the wide range of topics considered as domains within applied-linguistic inquiry. We believe that the volume reflects the evolution of linguistic answers not only to diverse questions that have been raised in the past, but also to ongoing debates taking place in a variety of disciplines.

Acknowledgments

The experience of editing reminded me of the many problems that academics face in keeping the deadlines. Those problems led to delays. Luckily, however, nothing led to serious problems. I am thus deeply grateful to the contributors who managed, in spite of other professional and personal pressures, to produce the chapters included in this volume.

I am also grateful to the National Institute for Japanese Language and Linguistics (NINJAL), which provided me with the position of invited professor, the office space, and necessary equipment including a computer. The idea of the *Handbook of*

Japanese Applied Linguistics was suggested by Dr. Masayoshi Shibatani, and my deepest gratitude is due to him and Dr. Taro Kageyama, NINJAL's Director-General. I also extend my gratitude to English and style check editor Dr. John Haig for his careful editorial assistance. Back at San Francisco State University, my home institution, I am deeply grateful to Dr. Paul Sherwin, retired Dean of the College of Liberal and Creative Arts, and Dr. Sue Rosser, Provost and Vice President for Academic Affairs. During my sabbatical leave (Spring 2013) I concentrated on editing the *Handbook of Japanese Applied Linguistics*. I also want to acknowledge the assistance of Ms. Anita Axt, Mr. Gary Bottone, Ms. Katy Bridges, Dr. Ruth Brousseau, and Mr. Nicholas Sturtevant in finding answers to editing queries, thus saving the need to respond to contributors and the extra time it would have added to the editing process. Finally, I would like to extend my deepest gratitude to my wife, Hitomi, and our children, Tomoko, Noritaka, and Kaori, who gave me moral support.

References

- Bialystok, Ellen. 2001. *Bilingualism in development: Language, literacy, and cognition*. New York: Cambridge University Press.
- Chomsky, Noam. 1957. *Syntactic structures*. The Hague: Mouton.
- Chomsky, Noam. 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.
- Cummins, Jim. 1979. Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research* 49(2). 222–251.
- Cummins, Jim. 1991a. Interdependence of first- and second-language proficiency in bilingual children. In Ellen Bialystok (ed.), *Language processing in bilingual children*, 70–89. New York: Cambridge University Press.
- Cummins, Jim. 1991b. Language development and academic learning. In Lilliam M. Malavé and Georgues Duquette (eds.), *Language, culture and cognition*, 161–175. Clevedon, England: Multilingual Matters.
- Labov, William. 1972. *Language in the inner city: Studies in the Black English vernacular*. Philadelphia, PA: University of Pennsylvania Press.
- MacWhinney, Brian. 2000. *The CHILDES project, Volume I: Tools for analyzing talk* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- MacWhinney, Brian and Catherine E. Snow. 1985. The Child Language Data Exchange System. *Journal of Child Language* 12(2). 271–296.
- MacWhinney, Brian and Catherine E. Snow. 1990. The Child Language Data Exchange System: An update. *Journal of Child Language* 17(2). 457–472.
- Ochs, Elinor, Emanuel A. Schegloff and Sandra A. Thompson (eds.). 1996. *Interaction and grammar*. New York: Cambridge University Press.
- Selinker, Larry. 1972. Interlanguage. *International Review of Applied Linguistics in Language Teaching* 10(3). 209–231.
- Schegloff, Emanuel A. 1997. “Narrative analysis” thirty years later. *Journal of Narrative and Life History* 7(1–4). 97–106.

I First language (L1) acquisition/development

Tamiko Ogura and Toshiki Murase

1 The roles of cognitive bases and caregivers' speech in early language development

1 Introduction

Language is mastered gradually within a developing social, cognitive, and communicative system. Both biological and environmental factors play a role in acquiring language. In this chapter, we first report cross-linguistic commonalities and differences in early language development of Japanese children. A large body of research using parental reports has examined individual differences among children in their acquisition of different languages. Most of these studies used a version of the MacArthur–Bates Communicative Development Inventories (MCDIs) (Fenson et al. 1993; Fenson et al. 2007), which has been translated into many languages. Using the same instrument and analysis enables researchers to make systematic comparisons of vocabulary development across countries and thus to identify cross-linguistic commonalities and differences. Second, we survey the social cognitive bases of language acquisition. Intention-reading skills, imitation, and mental representation as prerequisites for language acquisition and cultural universality of these cognitive skills will be discussed. Third, we discuss characteristics of caregiver input and their effects on children's language development. Caregivers' speech to young children is different from that to other adults in its prosodic, phonological, lexical, and syntactical properties (Soderstrom 2007). This style has been referred to as “baby talk”, “motherese”, “parentese”, infant-directed speech (IDS) or child-directed speech (CDS). We use IDS/CDS in this chapter. A prominent property of Japanese IDS/CDS is the frequent use of words, called *ikujigo* (IDS/CDS words) referring to words (e.g., *wanwan* ‘dog’, and *nenne* ‘sleep’), different than those used in adult-directed speech (ADS) referring to conventional words used among adults. We will discuss characteristics of *ikujigo* and what effects IDS/CDS has on children's vocabulary development.

These issues are important for clarifying the mechanisms underlying language development and are beneficial for speech therapists and educators who wish to develop assessments and intervention programs for language-delayed children.

2 Early language development

2.1 Cross-linguistic commonalities in early language development for Japanese children

Similar to other aspects of human development, language development is characterized by variations. Bates et al. (1995) reported enormous individual differences

in the onset time and the rate of growth in word comprehension, word production, first word combinations, and the first stage of grammar. According to Papaeliou and Rescorla (2011: 864), who provided summaries of cross-linguistic findings using the MCDI, major commonalities include (1) children in every country vary widely in their rate of lexicon acquisition, but that lexicons generally get larger with age, with acquisition accelerating from 1;0 to 2;0; (2) girls tend to have larger reported vocabularies than boys; (3) the lexicon comprehended typically exceeds the lexicon produced in the early months of language development; and (4) expressive vocabulary progress is associated with progress in the development of grammar.

2.1.1 Instruments for measuring early language development in Japanese children

In this section, referring to the aforementioned four commonalities (Papaeliou and Rescorla 2011), we report our Japanese Communicative Development Inventories (JCDIs). The JCDIs, which were adapted from the MCDIs, have two forms, the Infant Form (words and gestures) and the Toddler Form (words and grammar). From the MCDIs, we adapted the items for the “first signs of understanding”, “phrases”, “starting to talk”, “Part II: actions and gestures” for the Infant Form, and “how children use words” for the Toddler Form. The JCDI vocabulary checklist consists of 448 words in 20 categories for the infant version (adding “conversational words” (e.g., *nnn* ‘uh’), *unto* ‘uh-huh’) and “baby words” (e.g., *dakko* ‘cuddle’, *nenne* ‘sleep’, *kuku* ‘shoes’) to the infant version of MCDIs) and 711 words in 22 categories for the toddler version (deleting “helping verbs” from and adding “conversational words” and “baby words” to the toddler version of the MCDIs). The number of words in each category on the JCDIs was almost the same as on the MCDIs. Part II, “sentences and grammar”, of the Toddler Form required more language-specific changes. The sentence and grammar parts in the JCDI followed the MCDI in terms of the scales and number of items. In the JCDI, “word endings” and “word form” of the MCDI became “particles (*kyoshi*)” and “predicative suffixes (*jodōshi*)”. The section on sentence complexity comprised 37 items, including sub-domains covering case markers, sentence ending particles, conjugations, predicative suffixes, sophistication of predicates, expansion of one-word into two-word construction, and expansion of two-word into three-word construction.

We collected parental reports from 1,230 Japanese children aged 8–18 months (the infant version) and 2,861 Japanese children aged 16–36 months (the toddler version) (Ogura and Watamaki 2004; Watamaki and Ogura 2004).

2.1.2 Individual differences in the rate of learning vocabulary and grammar

Figure 1 shows the vocabulary production of 8–18-month-old infants who scored at the 10th, 25th, 50th, 75th, and 90th percentiles. Figure 2 shows the results for 16–36-

month-old toddlers. We found large individual differences in vocabulary production among Japanese children and accelerated vocabulary production from 1.0 to 2.0 years. We also found large individual differences with regard to grammar development. Figure 3 shows the sentence complexity scores for 16–36-month-old toddlers who scored in the 10th, 25th, 50th, 75th, and 90th percentiles.

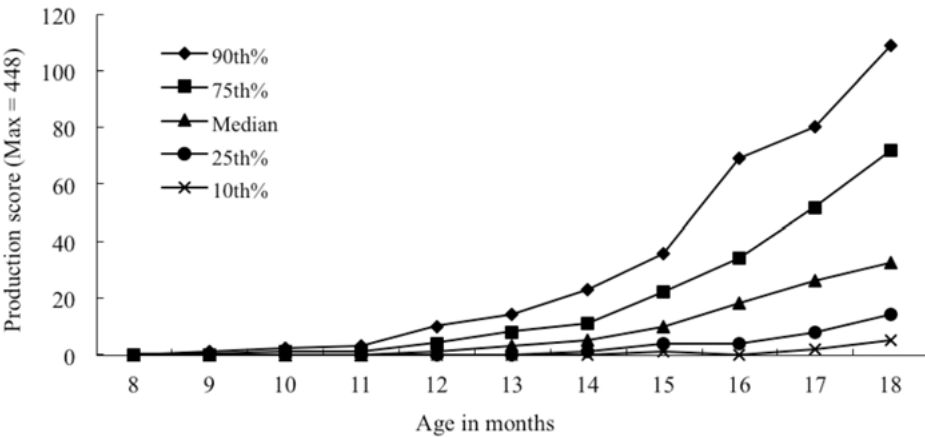


Figure 1: Vocabulary production by 8–18-month-old Japanese infants

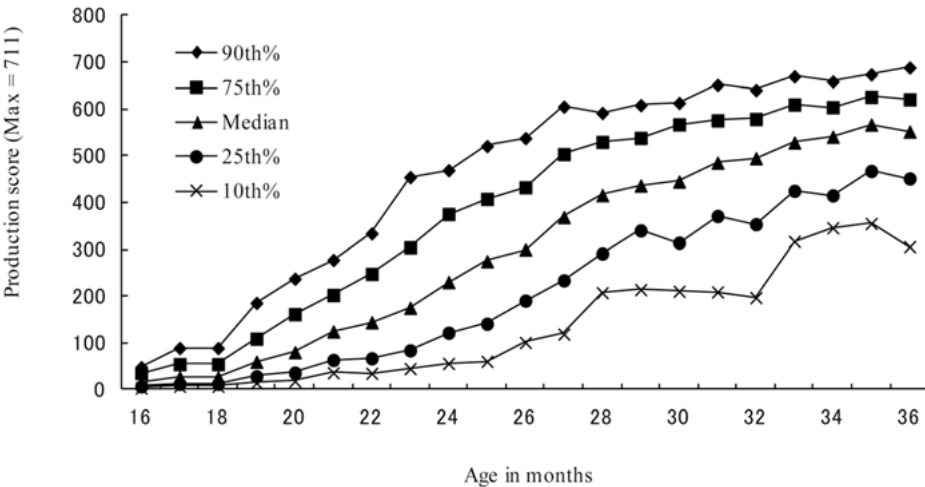


Figure 2: Vocabulary production by 16–36-month-old Japanese toddlers

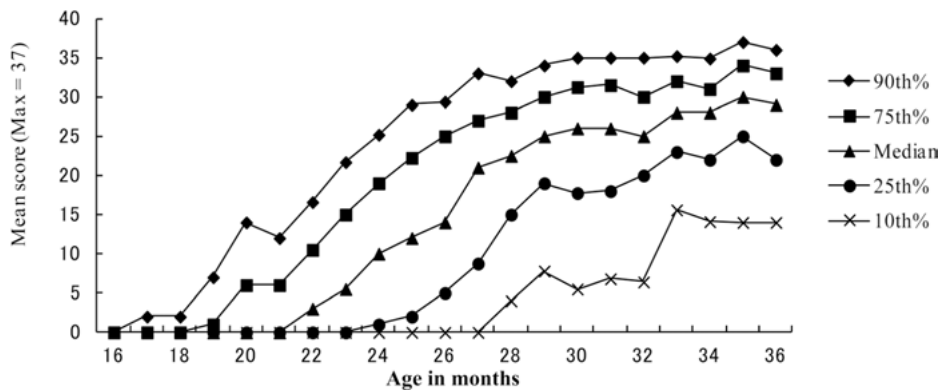


Figure 3: Sentence complexity of 16–36-month-old Japanese toddlers

In 2,861 children 16–36 months old, we also found that girls had a significantly larger vocabulary, higher scores for complexity, and longer sentences than did boys. Figure 4 shows the gender difference in terms of total vocabulary production.

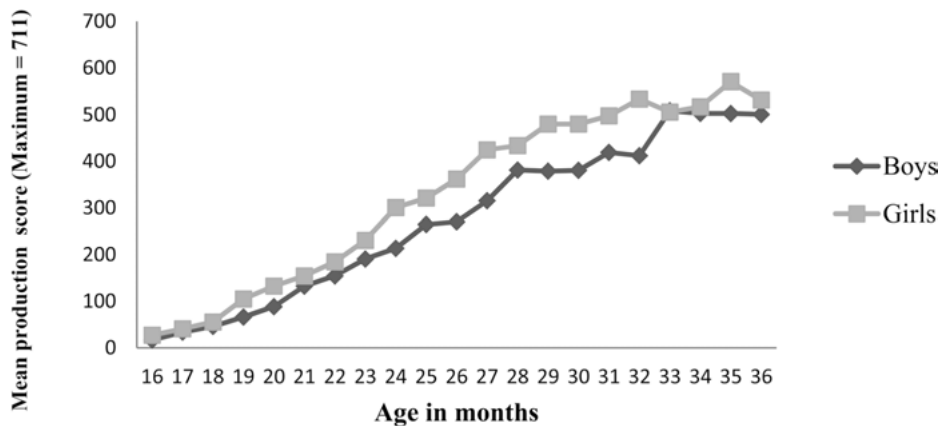


Figure 4: Mean vocabulary production scores of boys and girls

We also found that the lexicon comprehended by children typically exceeded the lexicon produced. Figure 5 shows the mean vocabulary production score and comprehension score of 8–18-month-old children.

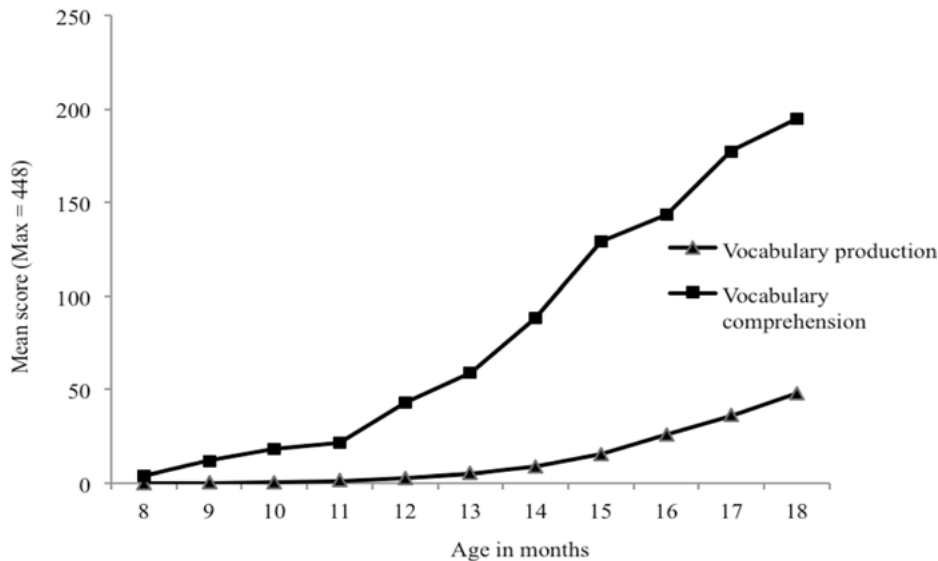


Figure 5: Mean vocabulary production and vocabulary comprehension scores

2.1.3 Relationship between grammar and lexicon development in Japanese children

With respect to the relationship between lexical development and grammatical development, we found that grammar development strongly depended on the establishment of a critical lexicon base. Figure 6 shows the percentage of children who

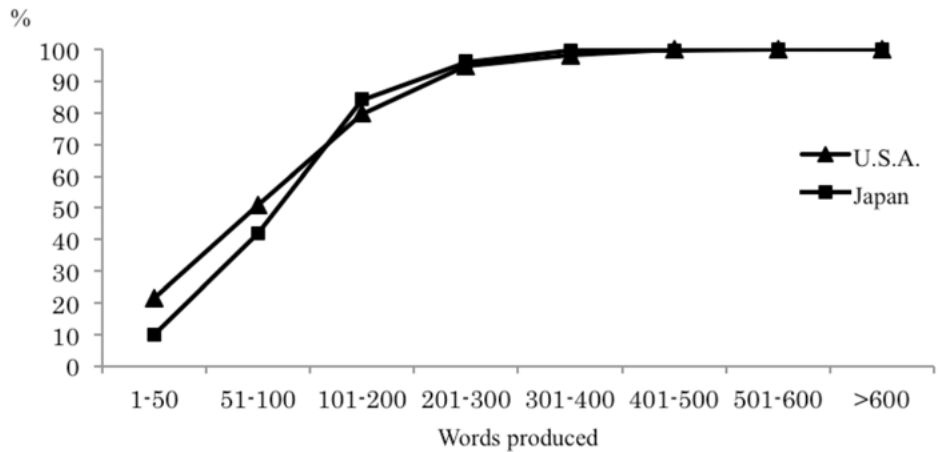


Figure 6: Percentage of toddlers in the US and Japan who combined words as a function of productive vocabulary

reportedly combined words as a function of productive vocabulary size (i.e., 1–50, 51–100, 101–200, 201–300, 301–400, 401–500, 501–600, and more than 600 words) in Japanese and US children. US children combined more words than Japanese children did at a vocabulary size of 1–50 words, but over 50 words, no difference was observed. For most children, word combination starts to appear when their vocabularies reach 51–200 words. Over 80% of children in Japan and the US at a vocabulary size over 100 words combined words.

Table 1 presents the bivariate correlations and partial correlations (which partial out age) between vocabulary and grammatical measures, namely, particles, predicative suffixes, sentence complexity, and MSL in Japanese children.¹ These results indicate a very strong relationship between vocabulary and several measures of grammatical development. Vocabulary and grammar results of Japanese children were consistent with American English (Fenson et al. 1994), Italian and English (Caselli et al. 1999; Devescovi et al. 2005), Hebrew (Maital et al. 2000), German (Szagun et al. 2006), and Slovenian data (Marjanovic-Umek et al. 2012).

Table 1: Bivariate and Partial Correlations between Vocabulary Production and Other Language Measures

	Vocabulary production	Particles	Predicative Suffix	Complexity	MSL
Vocabulary production		0.912***/ 0.814***	0.845***/ 0.724***	0.882***/ 0.749***	0.736***/ 0.496***
Age	0.749***	0.71***	0.641***	0.714***	0.648***

Note: The figures to the left of the slanted line show simple correlations; those to the right of the slanted line show partial correlations (age was controlled) *** $p < .001$.

¹ These measures come from the results of the toddler version of the JCDIs. The child's total score for vocabulary production, particle (*kyoshi*) and predicative suffix (*jodoshi*) were obtained by adding the items checked. Vocabulary production was total scores for 711 word items in 22 categories. Particle (*kyoshi*) score was for the 25 items of 9 case particles, 6 sentence-ending particles, 4 topic particles and 6 conjunctive particles. Predicative suffix (*jodoshi*) score was for the 30 items of 6 passive and potential suffixes, 6 causative suffixes, 4 polite suffixes, 3 negation suffixes, 3 desiderative suffixes, 3 copulas, 2 intensive suffixes, 1 present suffix, 1 past suffix, and 1 conjectural suffix.

Sentence complexity used a forced-choice recognition format in which parents choose the member of each of 37 sentence pairs that best reflects the child's present speech level. Sentence complexity items included 15 pairs in which particles were added, 9 pairs in which the predicate was made more sophisticated, 2 pairs in which one auxiliary word was added, and 11 pairs in which the syntactic component was expanded. Complexity score was determined by totaling the number of instances in which the parent marked the second (more complex) of the two alternatives in a pair.

Maximum Sentence Length (MSL) was average score (*katuyookei-huzokugo* MSL) for three children's recent longest sentences that their parents write down. Morpheme delimiters are independent words and attaching words that are connected to a conjugate form and/or independent word) (e.g., *boku/ga/tabe/ta*).

Several explanations have been offered for this close relationship. Dale et al. (2000) pointed out the following: (1) a sufficient supply of words is necessary for utterances; (2) learning words includes learning their grammatical properties; (3) early word combinations may be highly lexicon specific and hence have much in common with early vocabulary development; (4) learning relational words (verbs and adjectives) and closed classes (e.g., prepositions, auxiliaries, and conjunctions) has much in common with grammatical learning; (5) grammatical knowledge provides important cues for semantic learning; i.e., syntactical bootstrapping may significantly affect vocabulary learning.

Bates and Goodman (1999) concluded that there was no compelling evidence for a “hard” dissociation between grammar and lexicon and hence no evidence for the claim that grammar and lexicon are mediated by separate, dedicated, domain-specific neural systems. Instead, grammar is closely connected to the lexicon.

2.2 Cross-linguistic commonalities and differences in vocabulary components

Research has shown cross-linguistic commonalities and differences in vocabulary components of language. Conboy and Thal (2006) reported that children typically began to produce open-class or content words (nouns, verbs, and adjectives) in advance of closed-class items (words with grammatical functions, such as prepositions, determiners, and pronouns), and that within the open class, they tended to produce referential words (concrete nouns) before relational terms or predicates (verbs and adjectives). Using the same vocabulary checklists, Bornstein et al. (2004) supported the finding of a strong noun bias in early acquisition of Spanish, Dutch, French, Hebrew, Italian, Korean, and American English. In contrast, a study by Tardif, Gelman, and Xu (1999) comparing Mandarin and English verb/noun ratios showed that Mandarin-speaking children used more verbs and fewer nouns than did English-speaking children and that the distribution in various contexts varied significantly. In a book-reading context, but not in a toy-play context, children of both languages used more nouns than verbs.

In their research on Japanese children between 1 and 2 years of age, Ogura et al. (2006) found that context had the largest effect; nouns appeared much more frequently in the book-reading context. Noun dominance was constant across development in the book-reading context, but in the toy-play context, as children developed from single words through the presyntactic stage to the syntactic stage, there was a shift away from noun dominance. Caregiver language was verb dominant in a number of respects across development in the toy-play context and thus was not closely related to child lexical balance. Ogura et al. (2006) concluded that during early lexical development, all children have a conceptual disposition to learn nouns. The proportion of verbs increases substantially with vocabulary growth and the

emergence of grammar and properties of the input language may influence development at this stage.

Cross-linguistic and developmental differences in vocabulary composition were examined using the MCDIs of 817 US children and 1,230 Japanese children 8–18 months of age, and 1,130 US children and 2,112 Japanese children 16–30 months of age (Ogura, Watamaki, and Dale 2008). The absolute proportion of common nouns, predicates, and closed class words were computed for the children's total number words. Figure 7 shows the composition of comprehensive vocabulary at six vocabulary levels from 8 months to 16 months, whereas Figure 8 shows the composition of productive vocabulary at eight vocabulary levels from 16 months to 30 months. Common nouns were the predominant word class in both countries, and US children produced and comprehended more common nouns. Japanese children comprehended more predicate words than did US children at 8–16 months if they had vocabulary sizes exceeding 101 words. At 16–30 months of age, U.S. children produced more predicate words than did Japanese children if they had vocabulary sizes of 1–100 words; Japanese children produced more predicate words than did U.S. children if they had a vocabulary size between 301 and 600 words. Japanese children produced and comprehended more predicates at larger vocabulary sizes. No difference in vocabulary comprehension of closed-class words was observed between the two countries. U.S. children produced more closed class words than did Japanese children at vocabulary sizes of 1–100 and more than 501 words at 16–30 months.

Briefly, U.S. children and Japanese children produced and comprehended a larger proportion of nouns than of predicates, and a larger proportion of predicates than of closed class words. This pattern was consistent with U.S. children (Bates et al. 1994), Spanish children (Jackson-Maldonado et al. 1993), Italian children (Caselli, Casadio, and Bates 1999), and French children (Kern 2007). Japanese children had a smaller proportion of nouns at all vocabulary sizes and had a larger proportion of predicate words at a large vocabulary size than did U.S. children. These results may reflect the typological properties of the Japanese input language, such as whether noun phrases may be omitted when redundant from context ('pro-drop' languages), and predicate words (especially verbs) may be put in the final position of the sentence (e.g., *ringo taberu* 'I eat an apple'. Subject is deleted, and *taberu* (verb) is put in the final position), which was connected to large vocabulary size.

To summarize, discussing the Japanese CDIs data in section 1, we reported commonalities and differences in early language development. Lexicon and grammar develops with age, and the relationships between linguistic domains in early language indicated prototypic trends. We also found enormous individual variability.

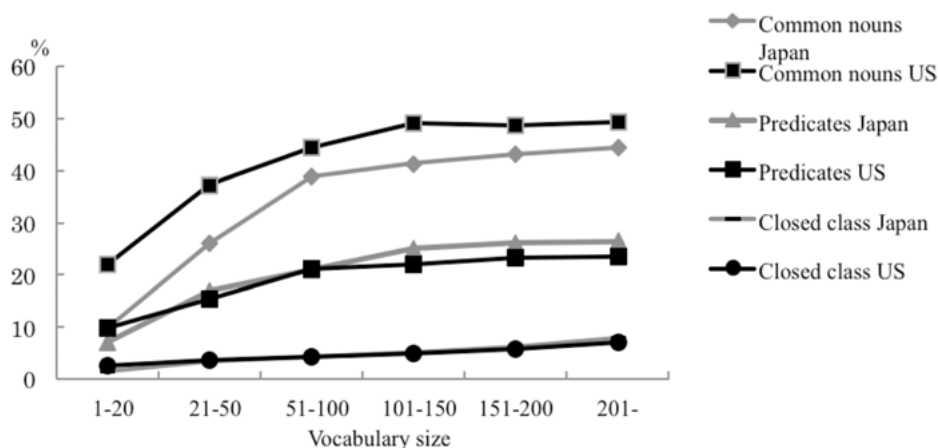


Figure 7: Composition of comprehensive vocabulary as a function of comprehensive vocabulary size (8–16 months)

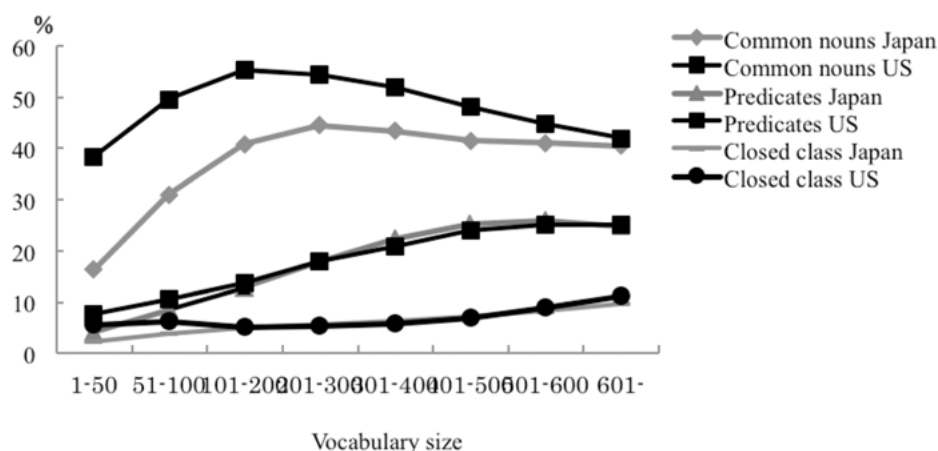


Figure 8: Composition of productive vocabulary as a function of productive vocabulary size (16–30 months)

3 Factors underlying individual differences

In this section we consider several factors that influence individual differences in language development. Differences across individuals can emerge as a consequence of the complex interaction of domain-general “waves” of skill that mix and mingle in various ways over the course of learning (Marchman and Thal 2005). Bates et al. (1979) presented their idea on *the emergence of symbols*. The candidate “old parts” leading to first words include imitation, tool use, and communicative intent. Each

has its own developmental time course, and they reach “threshold” levels at different points in time. Symbol use is the consequence of these three “precursors” coming together in the service of building a working system of communication (Marchman and Thal 2005). Language learning can be viewed as a complex and dynamic process in which various components emerge at various levels, to various degrees, and at various times. Individual differences are a natural consequence of learning within such a framework because of the dynamic and multi-faceted nature of the emergent system. Slight differences in the relative rate, strength, or timing of the component achievements can result in relatively large differences in behavioral outcomes among individuals (Bates et al. 1979; Bates, Dale, and Thal 1995). Children learn language in different ways because they receive different kinds of input. At the same time, a study of individual variation can tell us even more about the biological substrates of language. Language is an interactive system that depends crucially on processes and representations from a variety of cognitive domains. The acquisition of language will be shaped, and its timing influenced, by the emergence and development of these requisite cognitive systems. The variations observed in early language development are so large that they require substantial contributions from both genetic and environmental factors, with special emphasis on their interaction.

3.1 Cognitive bases of early language development

In this section, we examine the cognitive bases of language acquisition. Tomasello (2003) discussed two sets of skills that are of particular importance for language acquisition. The first set consists of various intention-reading skills, i.e., skills required for understanding others’ communications. Tomasello (2006) has stressed the social cognitive base for language acquisition. Linguistic communication is a special form of social interaction mediated by linguistic symbols. Children are exposed to linguistic symbols as they interact socially with mature language users. Children must have the social-cognitive skills to acquire productive use of linguistic conventions if they are to (1) participate with others in joint attentional interactions, (2) understand another’s communicative intentions, (3) take the perspective of others, and (4) collaborate with others in co-constructing conversation.

The second set of skills that are particularly important for language acquisition, according to Tomasello (2003), includes pattern finding and categorization. These skills, which also begin to emerge early in development, include the ability to (1) form perceptual and conceptual categories of “similar” objects and events, (2) form sensory-motor schemas from recurrent patterns of perception and action, (3) perform rudimentary statistically based distribution analyses of various kinds of perceptual and behavioral events, and (4) create analogies (structure mappings) across two or more complex wholes based on the similar functional roles of some elements of those wholes. These skills are necessary for children to find the pattern in the

way adults use linguistic symbols across different utterances and to construct the grammatical (abstract) dimensions of human linguistic competence.

3.1.1 Intention-reading skills and language development

Intention-reading skills, which first emerge in human ontogeny at around 9–12 months of age (Tomasello 2003), include the ability to (1) share attention to other persons, objects, or events of mutual interest; (2) follow the attention and gesturing of another person to distal objects and events outside the immediate interaction; (3) actively direct the attention of others to remote objects by pointing, showing, and using other nonlinguistic gestures; and (4) culturally (imitatively) learn the intentional actions of others, including the communicative acts underlain by communicative intentions. These skills are necessary if children are to acquire the appropriate use of linguistic symbols, including complex linguistic expressions and constructions.

A period of rapid language learning occurs between 14 and 18 months of age. During this period, children not only follow points to objects of interest but also monitor both the adult gaze behavior and the objects located, a strategy that clearly enhances language learning. Adult vocalization and naming further increase a child's tendency to follow parental gaze and point (McCune 2008). Carpenter, Nagell, and Tomasello (1998) found that the amount of time that mother–infant dyads spent in joint attentional engagement was reliably related to the infant's linguistic communication. Joint engagement at 12 and 15 months of age significantly predicts word comprehension at 12 and 15 months when language comprehension is first emerging. The relationship between joint engagement and language production is strongest at a later time (15, 18, and 24 months), when language production is first emerging. Through her meta-analytic investigation of 25 studies with 734 children, Colonnese et al. (2010) examined the relationship between pointing gestures and language. According to these researchers, studies conducted in the last 30 years have shown that both comprehension and production are related to language development and that this relationship is stronger when pointing is produced with a declarative or general motive. These results particularly support the referential and social-cognitive theoretical approaches to the relationship between pointing and language development.

3.1.2 Imitation and language development

Imitation is now considered an early skill that may be central to many other aspects of social development, such as language, pretend play, and understanding others' minds (McEwen, et al. 2007). Carpenter, Nagell, and Tomasello (1998) proposed early

imitative learning as evidence that infants are monitoring something of the adult's psychological state with respect to the object. The very best evidence of this is when children learn a new behavior as a result of observation. These authors distinguished the imitation of arbitrary actions including intention reading from the imitation of instrumental actions undertaken without understanding intention. Instrumental actions operate on objects, such as opening a hinge or compressing a spring. In imitating these actions, infants learn about objects instead of about the attention or behavior of other human beings. Tomasello (1999) called this emulation learning. Arbitrary imitation focuses on what the adult intends to do and involves performing the intended action rather than mimicking the adult's actual surface behavior. Meltzoff (1988) provided the following example of an arbitrary action. The object used was a box with a translucent panel on top that lighted up when touched. The action demonstrated by the adult was bending forward at the waist and touching the forehead to a light panel. Carpenter, Nagell, and Tomasello (1998) demonstrated that the ages at which imitation of instrumental actions and imitation of arbitrary actions appear are significantly positively correlated with the emergence of referential words.

Several studies have reported that the imitation of intentional actions of others and other types of imitation are related to language development. Studies have found considerable variation in the rates of elicited imitation during experimental tasks as well as in the rates of spontaneous imitation or "matching behavior" occurring during natural dyadic interactions without direct elicitation. Such individual differences in vocal/verbal imitation rate are also associated with consequences for vocabulary acquisition (Masur and Olson 2008). There is good evidence that vocal and gestural imitation is longitudinally associated with language development (Masur and Rodemaker 1999). Charman et al. (2000) reported that imitation of instrumental actions is longitudinally associated with expressive language ability at 20 months but with receptive language ability at 44 months. Heimann et al. (2006) reported that deferred imitation at 14 months is the strongest predictor of vocabulary comprehension.

Ogura et al. (2008) examined the longitudinal relationship between three imitation types (vocal, body movements, and actions with objects) at 11, 13, 15, and 18 months old and vocabulary comprehension and production in normal children at 18 months. These researchers showed significant partial correlations between language and imitation after controlling for comprehension/production (see Table 2). No significant correlations were found between imitation of body movements and language measures. No significant correlation was observed at 11 months and 13 months. Vocal imitation of onomatopoeia (e.g., *wanwan* 'woof woof') at 15 months and imitation of words (e.g., *inu* 'dog') at 18 months was significantly partially correlated with vocabulary production at 18 months. Imitation of a familiar action (swinging a cup containing blocks) was partially correlated with vocabulary comprehension at 15 months. Imitation action (hits blocks with a cup) is partially correlated

with vocabulary comprehension at 18 months. Vocal imitation is correlated with vocabulary production, and imitation of an action with objects is correlated with vocabulary comprehension when production/comprehension was partialled out. Specific dimensions of the modeled act influence imitation performance.

Table 2: Correlations between Imitation, Comprehension, and Production

	Imitation of action with objects			Vocal imitation	
	15 months	15 months	18 months	15 months	18 months
Language/ Imitation items	Familiar action	Unfamiliar action	Unfamiliar action	Onomatopoeia (<i>wanwan</i>)	Word (<i>inu</i>)
Vocabulary comprehension	.565**/.450**		.532**/.584**		
Vocabulary production	.421*/.193	.404*/.349		.352/.423*	.444*/.383*

Note: The figures to the left of the slanted line show simple correlations; those to the right of the slanted line show partial correlations (production was controlled in measuring comprehension and vice versa) * $p < .05$, ** $p < .01$.

Many studies (e.g., Rogers and Williams 2006) have reported a deficiency in imitation and language among autistic children. Toth et al. (2006) found that initiating protodeclarative joint attention and immediate imitation contributed to language ability at the outset (for autism spectrum disorder at age 3–4 years), whereas toy play and deferred imitation skills may have contributed to the continued expansion of language communication skills over the preschool and early school age period (at ages of 4–6.5 years) in autistic children. Joint attention, imitation, and toy play might be interrelated, and these serve as cognitive bases for language acquisition in typical developing children and in those with autism.

3.1.3 Mental representation and language development

As children make the transition to language, they are also making the transition from an obligatory perceptual mode of understanding the world to the capacity for mental representation, an essential development for referential language (McCune, 2008). Mental representation is derived from earlier purely perceptual and motor processes that will continue to affect cognition as later abilities develop. According to Piaget (1971), language is merely one particular instance of the semiotic or symbolic function, which includes delayed imitation, a system of gestural symbols, symbolic play, mental imagery, and written or drawn pictures. Piaget suggested the existence of synchronism between language and symbolic play.

McCune-Nicolich (1981) proposed correspondence in the development of play and language that follows from the analysis of developmental changes in signifier–signified relationships observable in both domains. McCune (1995) proposed three relationships: (1) the onset of lexicon with the onset of pretending, (2) the onset of language combinations with the onset of symbolic play combinations, and (3) the onset of syntax in language with hierarchical combinations in play.

Similarly, through the longitudinal study of four Japanese children (aged 7–11 months at the beginning of the study), Ogura (1991) examined developmental correspondences between the onset of six language landmarks (emergence of first words, naming words, vocabulary spurts, word chains, nonproductive two-word utterances, productive two-word utterances) and the onset of play subcategories. She found that language and play both reflected the development of underlying symbolic ability, and both developed in a parallel manner at the single-word stage. After the emergence of word chains, language and play developed interdependently. All children proceeded through the same sequence of stages, but the rate of development was different depending on their environment. Many researchers have found that correlations between language and play were stronger in early language development and that the two domains did not develop in parallel as the child matured (O’Toole and Chiat 2006). These findings also highlight that cognitive domains become increasingly modular with development and may not be strictly ‘innate’ from birth, which is in line with the neuroconstructivist approach to development (Karmiloff-Smith 1998).

3.1.4 Universality in the development of social cognitive skills

Lieven and Stoll (2010) believe that there is little reason to think that cognitive abilities fundamentally differ among infants reared in different cultures. The major developments in social-cognitive skills between 9 and 12 months are almost certainly universal. Thus, as far as we know, pointing develops universally from approximately the age of 9 months and is used for the same age-related range of functions worldwide: requesting, drawing attention, and informing. Liszkowski et al. (2012) provided evidence for the universality of a prelinguistic gestural basis for human communication in seven cultures including Papua New Guinea (Rossel Island), Indonesia (Bali), Japan (Kyoto), Peru (Montaro Valle), Mexico (Tzeltal Mayans), Mexico (Yucatec Mayan), and Canada (Nova Scotia). The results indicated that by 10–14 months of age, infants and their caregivers in all cultures engaged in pointing behavior in the same basic situations with similar frequencies and using the same prototypical morphology of an extended index finger. Infant pointing was best predicted by age and caregiver pointing, not by cultural group. Further analyses revealed a strong relationship between the temporal unfolding of caregiver and infant pointing events, uncovering a structure of early prelinguistic gestural conversation. These findings

support the existence of a gestural, language-independent universal of human communication that forms a culturally shared, prelinguistic basis for diversified linguistic communication.

Callaghan et al. (2011) demonstrated the basic social-cognitive skills of 1-year-old children for understanding the intentions and attention of others (i.e., joint attention, instrumental imitation, helping, gaze following, and declarative pointing), showing that these were largely similar across rural Canada, rural Peru, and India. They also assessed the skills of 2- to 3-year-old children within two symbolic systems (pretense and pictorial symbols). They found that Canadian children, who had much more experience with such symbols, showed skills at an earlier age. They concluded that young children in all cultural settings get sufficient amounts of the right kinds of social experience to develop their most basic social-cognitive skills for interacting with others and participating in culture at around the same age. In contrast, children's acquisition of more culturally specific skills for use in practices involving artifacts and symbols (specifically pretense actions and pictorial symbols) is more dependent on specific learning experiences. Callaghan et al. (2011) also reported that infants began to comprehend words around the same age (9–10 months) in all cultural settings, but the onset of production varied. Canadian mothers reported that their infants began to produce words around 11.5 months, approximately 3 months earlier than mother's reports for infants in Peru and 4 months earlier than in India. Social cognitive skills and the onset of vocabulary comprehension is not so different between cultures, but the onset of vocabulary production differs among infants reared in different cultures.

4 Effects of caregivers' speech on children's language development

4.1 Effects of the caregivers' speech on individual differences in vocabulary development

The cultural backgrounds in which children are reared vary widely. Children learn from what they hear. In this section, we consider caregivers' input, one of the factors that influence individual differences in early language development. Caregivers' speech has attracted much attention as a factor to explain individual differences in early vocabulary development. Longitudinal studies (e.g., Masur, Flynn, and Eichorst 2005) have estimated individual differences in the properties of caregivers' speech at an earlier time and estimated individual differences in children's vocabulary development, such as productive vocabulary size and the age of acquiring 50 expressive words, controlling for individual differences in children's vocabulary development at the earlier time.

Caregivers directiveness had been hypothesized to have a negative effect on children's vocabulary development. However, recent studies have shown that caregivers' directiveness in following children's attention was positively related to children's productive vocabulary size, although caregiver directiveness that took the form of intrusively redirecting children's attention had a negative relationship with vocabulary size (Akhtar, Dunham, and Dunham 1991; Masur, Flynn, and Eichorst 2005). Caregivers' speech in response to children's attention and joint activities between caregivers and children was positively related to children's productive vocabulary at the later time (Carpenter, Nagell, and Tomasello 1998).

Caregiver responsiveness also showed a positive relationship with children's vocabulary development. Responsiveness implies prompt reactions to children's behaviors, contingent reactions that depend on children's behaviors and appropriate reactions that are conceptually and positively connected to children's behaviors. Caregivers' responsiveness to 13-month-old children showed a positive relationship with children's productive vocabulary size at the later time and with the speed at which they acquired 50 expressive words (Bornstein, Tamis-LeMonda, and Haynes 1999).

The effect of caregivers' speech on the development of children's vocabulary undergoes a change around the middle of the children's second year. Hoff and Naigles (2002) did not find an effect of caregivers' joint attention and the number of topic-continuing replies to 21-month-old children on the number of word types in children's speech at the later time. However, they found an effect of the number of word types and mean length of utterances in caregivers' speech on children's vocabulary development, whereas Bornstein, Tamis-LeMonda, and Haynes (1999) did not find a relationship between the number of caregiver's word types to 13-month-old children and the number of word types in 20-month-old children's speech. These studies suggest that the effects of caregiver speech style change depending on children's developmental level. Before the middle of the second year, joint attention and caregiver's responsiveness were positively related to children's vocabulary development. However, the effects of joint attention and caregiver responsiveness on children's vocabulary development decreased as children matured, but the variety and informativeness of caregiver's speech had a greater effect.

4.2 Infant- and child-directed speech (IDS/CDS)

In IDS/CDS, higher and more variable pitch, shorter duration of utterances, and longer pause duration are found in Japanese mothers and fathers as well as their English, American, French, German, and Italian counterparts (Fernald et al. 1989). Phonological modification and reduplication are often found cross-linguistically in IDS/CDS (Ferguson 1964), including in Japanese (Toda, Fogel, and Kawai 1990). Acoustically, more extreme vowels are used, resulting in a stretching of vowel space

in IDS/CDS compared with adult-directed speech (ADS) in the United States, Russia, and Sweden (Kuhl et al. 1997). A similar tendency was found in Japan (Miyazawa et al. 2009).

One additional phonological and lexical property of IDS/CDS is the use of diminutives. Diminutives are phonological derivations that express smallness and imply affection and endearment. Although English has some diminutives such as “doggie” and “foxy”, the use of diminutives is relatively restricted in English. In other languages, such as Dutch, German, Spanish, Lithuanian, and Polish, diminutives are used more pervasively (Kempe, Brooks, and Gillis 2007). In Japanese, the suffixes *san*, *tyan*, and *kun* can be seen as a kind of diminutive because these suffixes imply affection and endearment to the referred object. An additional difference is that suffixes, such as *san*, *tyan*, and *kun*, are used for personification. These are often attached to animals (e.g., *zoo-san* for an elephant) and even to inanimate objects (e.g., *tokei-san* for a clock) in IDS/CDS (Murase, Ogura, and Yamashita 2007), whereas these suffixes are usually attached to persons in ADS.

4.2.1 IDS/CDS words in Japanese

Murase, Ogura, and Yamashita (2007) investigated the use of IDS/CDS words for 256 items using a vocabulary checklist. A total of 291 mothers of 16–27 month old children reported the words that they use when speaking to their children. Murase, Ogura, and Yamashita (2007) found onomatopoeia and mimetics (e.g., *buubuu* for a car), reduplication (e.g., *meme* for an eye), adding suffixes *san*, *tyan*, and *kun*, and the honorific prefix *o*, and generalization (e.g., *man'ma* for every food, which means that *man'ma* [IDS/CDS] refers not only to rice but also a broader range of foods such as cookies and apples, in contrast to *gohan* [ADS], which refers only to rice although it sometimes refers to food in general or meal).

What effects does IDS/CDS have on children's vocabulary development? We need further evidence to clarify this issue. We will discuss some scaffolding effects of IDS/CDS words from experimental studies that investigated the effects of prosodic and phonological aspects of IDS/CDS, sound-symbolic aspect of onomatopoeia and mimetics, and the function as a cue for word segmentation in adding suffixes.

4.2.2 Effects of prosodic and phonological IDS/CDS on vocabulary development

Prosodic properties of IDS/CDS benefit infants' acquisition of words. Infants prefer listening to IDS/CDS (Cooper and Aslin 1990). IDS/CDS prosody facilitates word segmentation by infants (Thiessen, Hill, and Saffran 2005) and word-object mapping (Ma et al. 2011). These findings support the assumption that IDS/CDS prosody facilitates word acquisition.

Prosodic and phonological properties peculiar to IDS/CDS words also provide similar benefits. Mazuka, Kondo, and Hayashi (2008) found that the most frequent IDS/CDS words were three-mora, two-syllable and four-mora, two-syllable words, particularly RSR- and RSRS-type words (R: regular mora; S: special mora including nasal, geminate), which were the first- and second-most-frequent types of words in IDS/CDS. Hayashi, Kondo, and Mazuka (2001) found that 8- to 10-month-old infants prefer listening to RSR-type word lists. Hayashi and Mazuka (2010) found that RSR-type words facilitated word segmentation by 9-, 11-, and 12-month-old infants. Kobayashi and Murase (2011) presented two novel words, an IDS/CDS and a conventional ADS word, with a single object and found that 16-month-old children preferentially associated an IDS/CDS word with the object. These findings support the argument that IDS/CDS words facilitate acquisition of words.

4.2.3 Effects of sound symbolism on vocabulary development

Onomatopoeia and mimetics are sound symbolic in that the relationship between sound and meaning are non-arbitrary. Onomatopoeia includes words for sounds of animals and vehicles (*giongo*) and mimetics include words referring to events and states in which sound is not essential (*gitaigo*). Imai et al. (2008) reported that sound symbolism facilitated verb learning. Japanese 3-year-old children learned novel sound-symbolic verbs and novel non-sound-symbolic verbs for actions. They generalized novel sound-symbolic verbs to the same action by a new agent, but they did not generalize novel non-sound-symbolic verbs. Several studies have found the benefit of mimetic verbs in English-speaking children (Kantartzis, Imai, and Kita 2011) and in Japanese- and monolingual English-speaking American 2- and 3-year-old children (Yoshida 2012). However, Haryu and Zhao (2007) showed that Chinese students without knowledge of Japanese did not match Japanese sound symbolism of voiced/unvoiced consonants with a big/small object's movement, whereas Japanese students and Chinese students with knowledge of Japanese successfully matched them. Which kinds of sound symbolism are universal, and which are language specific? This issue should be clarified in future studies.

4.2.4 Effects of adding suffixes on vocabulary development

The suffixes *san*, *tyan*, and *kun* can be used as a cue to differentiate a word from fluent speech because they are often added to various words in Japanese IDS/CDS. Kemp, Brooks, and Gillis (2005) showed that native adult English speakers obtain a benefit from using diminutives to segment a word from Dutch speech. Hayashi and Mazuka (2010) showed that Japanese infants over 7-months of age segmented a word using the suffix *tyan* as a cue. These studies suggest that diminutives and suffixes in

IDS/CDS scaffold language acquisition for children by providing cues to segment words.

4.3 IDS/CDS and children's language development

Caregiver's IDS/CDS is fine-tuned as a function of children's language development. Ogura, Yoshimoto, and Tsubota (1997) reported that in a longitudinal observation study that followed two children from 13 to 28 months of age, the caregivers adjusted their use of IDS/CDS words to suit the children's linguistic and cognitive development. Here IDS/CDS words include reduplication, onomatopoeia, and mimetics. The transition point from IDS/CDS words to conventional words occurs at 21 months of age for one boy and 24 months of age for one girl. Interestingly, the mother's use of IDS/CDS words to speak to these two children decreased one session before the decrease in the children's use of IDS/CDS words. At this point, the children's linguistic and cognitive change also seems to have occurred, as evidenced by their production of two-word utterances and the beginning of planned play.

Additionally, Ogura (2006) showed a similar pattern of caregiver's regulation of IDS/CDS words according to children's linguistic ability in a cross-sectional study of Japanese children between 1 and 2 years of age. IDS/CDS words by children and caregivers decreased along with children's linguistic development. These results demonstrate how caregivers adjust their IDS/CDS words according to their children's linguistic and cognitive development.

Fernald and Morikawa (1993) compared the speech of Japanese and American mothers to 6-, 12-, and 19-month-old children in a cross-sectional study in which 60 dyads were observed with toys at their homes. The most striking cultural difference was that Japanese mothers used onomatopoeic words, such as *buubuu* 'vromm vromm' and *wanwan* 'woof woof', more frequently than any other type of noun in speaking to infants at all three ages, whereas American mothers almost never used this form of word. However, there are reports of cultures that do not show some or all of the IDS/CDS features. In their study of children's acquisition of Quiche Mayan, Bernstein-Ratner and Pye (1984) reported that small infants were not spoken to with the prosodically higher pitch that characterizes IDS/CDS. Observing the Kaluli of Papua, New Guinea, Ochs and Schieffelin (1984) found another example of how IDS/CDS differs from Western societies. There are also some reports of cultures in which adults do not seem to talk to infants much, if at all. The manner of speaking that is regarded as appropriate for use in speaking to children is closely linked to adults' ideologies of child rearing. Infants from different backgrounds may develop a communicative style that mirrors their everyday experiences with parents. Different communicative styles will cause different language developmental paths. More work is needed within cultures where child-rearing variations suggest variations in the language-learning situation (Lieven 1994).

5 Conclusion and future direction

We confirmed several cross-linguistic commonalities in early language development in Japanese children: (1) female superiority in lexicon and in grammar, (2) dissociation of vocabulary comprehension and production, (3) association of lexicon and grammar, and (4) noun dominance in early vocabulary. Maturational and biological factors contribute to these prototypic trends during early language development. Social-cognitive skills that are prerequisites for language acquisition, such as intention reading and imitation, might be universal, as Callaghan et al. (2011) suggested. The dissociation of vocabulary comprehension and production might depend on cognitive factors. Vocabulary comprehension and production are associated with different cognitive abilities. Whereas intention reading and imitation of action with objects are related to vocabulary comprehension, vocal imitation and substitution play are related to vocabulary production. The onset time of vocabulary comprehension and social-cognitive skills might be universal. But the onset time of vocabulary production might be not universal. We will need to clarify whether there are cultural differences in cognitive skills and other skills (e.g., oral motor skills) related to vocabulary production.

We found enormous individual differences in the rate of lexicon and grammar learning. Variation in acquisition must, to some extent, have its origins in the qualitative and quantitative difference in the ways adults talk to children, in social variables (e.g., birth order, socioeconomic status), and in cognitive factors. Many factors contribute to the individual differences that are observed. Especially caregivers' input will influence on individual differences. There are some reports of cultures that do not show some or all of the features of IDS/CDS. The important question is what the outcome is in terms of what children actually hear and how they build their language from it (Lieven & Stoll, 2010).

Frequent use of IDS/CDS words as well as ADS words in Japanese caregivers introduce an interesting issue to be clarified: how Japanese children acquire dual labels for an object. The effect of IDS/CDS on the children's cognition is another issue to be clarified. For example, do the suffixes such as *san*, *tyan* and *kun* used for personification have effects on the cognition about animate and inanimate objects?

Research on language, cognition, and caregivers' input and the interrelationship of these factors from a cross-cultural and cross-linguistic point of view will help us clarify the mechanisms of language acquisition. Also we need the training studies controlling cognitive and input variables to clarify what factors contribute to language development.

Acknowledgments

Part of this study was supported by a Grant-in-Aid for Scientific Research (C) from the Japan Society for the Promotion of Science (#24530844) to Tamiko Ogura. The research on the JCDIs and MCDIs was collaborative work with Toru Watamaki and Philip S. Dale. We thank them for giving us permission to include part of their results in this study. We appreciate Masahiko Minami's valuable comments on an earlier draft of this manuscript.

References

- Akhtar, Nameera, Frances Dunham and Philip, J. Dunham. 1991. Directive interactions and early vocabulary development: The role of joint attentional focus. *Journal of Child Language* 18(1). 41–49.
- Bates, Elizabeth, Laura Benigni, Inge Bretherton, Luigia Camaioni, and Virginia Volterra. 1979. *The emergence of symbols: Cognition and communication in infancy*. New York: Academic Press.
- Bates, Elizabeth, Philip S. Dale, and Donna Thal. 1995. Individual differences and their implications for theories of language development. In Paul Fletcher and Brian MacWhinney (eds.), *Handbook of Child Language*, 96–151. Oxford, UK: Basil Blackwell.
- Bates, Elizabeth and Judith C. Goodman. 1999. On the emergence of grammar from lexicon. In Brian MacWhinney (ed.), *The emergence of Language*, 29–79. Mahwah, NJ: Lawrence Erlbaum.
- Bates, Elizabeth, Virginia Marchan, Donna Thal, Larry Fenson, Philip Dale, J. Steven Reznick, Judy Reilly and Jeff Hartung. 1994. Developmental and stylistic variation in the composition of early vocabulary. *Journal of Child Language* 21(1). 85–123.
- Bernstein-Ratner, Nan, and Pye Clifton. 1984. Higher pitch in babytalk is not universal: Acoustic evidence from Quiche Mayan. *Journal of Child Language* 11(3). 515–522.
- Bornstein, Marc. H., Catherine S. Tamis-LeMonda and O. Maurice Haynes. 1999. First words in the second year: Continuity, stability, and models of concurrent and predictive correspondence in vocabulary and verbal responsiveness across age and context. *Infant Behavior and Development* 22(1). 65–85.
- Bornstein, Marc. H., Linda R. Cote, Sharone Marital, Kathleen Painter, Sung-Yun Park, Liliana Pascual, Marie-Germaine Pecheux, Josette Ruel, Paola Venuti, and Andre Vyt. 2004. Cross-linguistic analysis of vocabulary in young children: Spanish, Dutch, French, Hebrew, Italian, Korean, and American English. *Child Development* 75(6). 1115–1139.
- Callaghan, Tara, Henrike Moll, Hannes Rakoczy, Felix Warneken, Ulf Liszkowski, Tanya Behne, and Michael Tomasello. 2011. Early social cognition in three cultural contexts. *Monographs of the Society for Research in Child Development* 76(2). 1–142.
- Carpenter, Malinda, Katherine Nagell, and Michael Tomasello. 1998. Social cognition, joint attention and communicative competence from 9 to 15 months of age. *Monographs of the Society for Research in Child Development* 63(4). 1–143.
- Caselli, Critina, Paola Casadio, and Elizabeth Bates. 1999. A comparison of the transition from first words to grammar in English and Italian. *Journal of Child Language* 26(1). 69–111.
- Charman, Tony, Simon Baron-Cohen, John Swettenham, Gillian Baird, Antony Cox, and Aurio Drew. 2000. Testing joint attention, imitation, and play as infancy precursors to language and theory of mind. *Cognitive Development* 15(4). 481–498.

- Colonnesi, Cristina, Stams Geert Jan J. M., Irene Koster, and Marc J. Noom. 2010. The relation between pointing and language development: A meta-analysis. *Developmental Review* 30(4). 352–366.
- Conboy, Barbara T. and Donna Thal. 2006. Ties between the lexicon and grammar: Cross-sectional and longitudinal studies of bilingual toddlers. *Child Development* 77(3). 712–735.
- Cooper, Robin Panneton and Richard N. Aslin. 1990. Preference for infant-directed speech in the first month after birth. *Child Development* 61(5). 1584–1595.
- Dale, Philip. S., Ginette Dionne, Thalia C. Eley, and Robert Plomin. 2000. Lexical and grammatical development: a behavioral genetic perspective. *Journal of Child Language* 27(3). 619–642.
- Devescovi, Antonella, Cristina Maria Caselli, Patrizio Pasqualetto, Judy Reilly, and Elizabeth Bates. 2005. A crosslinguistic study of the relationship between grammar and lexical development. *Journal of Child Language* 32(4). 759–786.
- Fenson, Larry, Philip. S. Dale, Steven J. Reznick, Elizabeth, Bates, Donna Thal, and Steve Pethick. 1994. Variability in early communicative development. *Monographs of the Society for Research in Child Development* 59(5). 1–173.
- Fenson, Larry, Philip S. Dale, Steven J. Reznick, Donna Thal, Elizabeth Bates, Jeffery P. Hartung, Steve Pethick, and Judy S. Reilly. 1993. *MacArthur communicative development inventories: User's guide and technical manual*. San Diego, CA: Singular Publishing Group.
- Fenson, Larry, Virginia Marchman, Donna Thal, Philip S. Dale, Steven J. Reznick, and Elizabeth, Bates. 2007. *MacArthur-Bates communicative development inventories: User's guide and technical manual*, 2nd edn. Baltimore: Paul H. Brookes Publishing.
- Ferguson, Charles A. 1964. Baby talk in six languages. *American Anthropologist* 66, no. 6/2. 103–114.
- Fernald, Anne and Hiromi Morikawa. 1993. Common themes and cultural variations in Japanese and American mothers' speech to infants. *Child Development* 64(3). 637–656.
- Fernald, Anne, Traute Taeschner, Judy Dunn, Mechthild Papousek, Benedicte de Boysson-Bardies and Ikuro Fukui. 1989. A cross-language study of prosodic modifications in mothers' and fathers' speech to preverbal infants. *Journal of Child Language* 16(3). 477–501.
- Haryu, Etsuko and Lihua Zhao. 2007. *Yūseion to museion o daishō ni taiōzokeru kankaku no kigen: Giongo rikai no Nitchū hikaku* [Understanding the symbolic values of Japanese onomatopoeia: Comparison of Japanese and Chinese speakers]. *Shinrigaku Kenkyū* [The Japanese Journal of Psychology] 78(4). 424–432.
- Hayashi, Akiko, Tadahisa Kondo and Reiko Mazuka. 2001. *Nyūji ni okeru go no rizumu kōzō e no han'nō* [Infants' sensitivity to the rhythmic patterns of Japanese words]. *Denshi-jōhō-tsūshin-gakkai Gijutsu-kenkyū-hōkoku* [Technical Report of the Institute of Electronics, Information, and Communication Engineers] 101, no. 349. 25–31.
- Hayashi, Akiko and Reiko Mazuka. 2010. *Seigo 5-13-kagetsureiji no onsei chikaku hattatsu ni kansuru kenkyū: Go no kiridashi nōryoku no hattatsu ni tsuite* [Infants' speech perception between 5- and 13-months: Developmental change in word segmentation abilities]. *Nihon-onkyō-gakkai chōkaku-kenkyūkai shiryō* [Transaction on Technical Committee of Psychological and Physiological Acoustics] 40(6). 525–530.
- Heimann, Mikael, Karin Strid, Lars Smith, Tomas Tjus, Stein Erik Ulvund, and Andrew N. Meltzoff. 2006. Exploring the relation between memory, gestural communication, and the emergence of language in infancy: A longitudinal study. *Infant and Child Development* 15(3). 233–249.
- Hoff, Erika and Letitia Naigles. 2002. How children use input to acquire a lexicon. *Child Development* 73(2). 418–433.
- Imai, Mutsumi, Sotaro Kita, Miho Nagumo and Hiroyuki Okada. 2008. Sound symbolism facilitates early verb learning. *Cognition* 109(1). 54–65.

- Jackson-Maldonado Donna, Donna Thal, Virginia Marchman, Elizabeth Bates, and Vera Gutierrez-Clellen. 1993. Early lexical development in Spanish-speaking infants and toddlers. *Journal of Child Language* 20(3). 523–549.
- Kantartzis, Katerina, Mutsumi Imai and Sotaro Kita. 2011. Japanese sound-symbolism facilitates word learning in English-speaking children. *Cognitive Science* 35(3). 575–586.
- Karmiloff-Smith, Annette. 1998. Development itself is the key to understanding developmental disorders. *Trends in Cognitive Sciences* 2(10). 389–398.
- Kempe, Vera, Patricia J. Brooks and Steven Gillis. 2005. Diminutives in child-directed speech supplement metric with distributional word segmentation cues. *Psychonomic Bulletin and Review* 12(1). 145–151.
- Kempe, Vera, Patricia J. Brooks and Steven Gillis. 2007. Diminutives provide multiple benefits for language acquisition. In Ineta Savickienė and Wolfgang U. Dressler (eds.), *The acquisition of diminutives: A cross-linguistic perspective*, 319–342. Amsterdam and Philadelphia: John Benjamins.
- Kern, Sophie. 2007. Lexicon development in French-speaking infants. *First Language* 27(3). 227–250.
- Kobayashi, Tessei and Toshiki Murase. 2011. Learning multiple labels for a single object in Japanese children. Poster presented at the 36th Boston University Conference on Language Development, Boston University, 4–6 November.
- Kuhl, Patricia K., Jean E. Andruski, Inna A. Chistovich, Ludmilla A. Chistovich, Elena V. Kozhevnikova, Viktoria L. Ryskina, Elvira I. Stolyarova, Ulla Sundberg and Francisco Lacerda. 1997. Cross-language analysis of phonetic units in language addressed to infants. *Science* 277, no. 5326. 684–686.
- Lieven, Elena. 1994. Crosslinguistic and crosscultural aspects of language addressed to children. In Clare Gallaway and Brian J. Richards (eds.), *Input and interaction in language acquisition* 56–73. Cambridge, UK: Cambridge University Press.
- Lieven, Elena and Sabine Stoll. 2010. Language. In Marc H. Bornstein. (ed.), *Handbook of cultural developmental science* 143–160. New York: Psychology Press.
- Liszkowski, Ulf, Penny Brown, Tara Callaghan, Akira Takada, and Conny Devos. 2012. A prelinguistic gestural universal of human communication. *Cognitive Science* 6(4). 698–713.
- Ma, Weiyi, Roberta Michnick Golinkoff, Derek Houston, and Kathy Hirsh-Pasek. 2011. Word learning in infant- and adult-directed speech. *Language Learning and Development* 7(3). 209–225.
- Maital, Sharone, Esther Dromi, Abraham Sagi, and Marc H. Bornstein. 2000. The Hebrew communicative development inventory: Language specific properties and cross-linguistic generalizations. *Journal of Child Language* 27(1). 43–67.
- Marchman, Virginia and Donna Thal. 2005. Words and grammar. In Michel Tomasello and Dan Slobin (eds.), *Beyond nature-nurture: Essays in honor of Elizabeth Bates*, 139–164. Mahwah, NJ: Lawrence Erlbaum.
- Marjanovic-Umek, Ljubica, Urska Fekonja-Peklaj, and Anja Podlesek. 2012. Characteristics of early vocabulary and grammar development in Slovenia-speaking infants and toddlers: a CDI-adaptation study. *Journal of Child Language*. <http://dx.doi.org/10.1017/S0305000912000244> (accessed 17 August 2012).
- Masur, Elise Frank and Janet Olson. 2008. Mother's and infant's responses to their partners' spontaneous action and vocal/verbal imitation. *Infant Behavior and Development* 31(4). 704–715.
- Masur, Elise Frank and Jennifer E. Rodemaker. 1999. Mothers' and infants' spontaneous vocal, verbal, and action imitation during the second year. *Merrill-Palmer Quarterly* 45(3). 392–412.
- Masur, Elise Frank, Valerie Flynn and Doreen L. Eichorst. 2005. Maternal responsive and directive behaviours and utterances as predictors of children's lexical development. *Journal of Child Language* 32(1). 63–91.

- Mazuka, Reiko, Tadahisa Kondo and Akiko Hayashi. 2008. Japanese mothers' use of specialized vocabulary in infant-directed speech: Infant-directed vocabulary in Japanese. In Nobuo Masataka (ed.) *The origin of language: Unraveling evolutionary forces*, 39–58. Tokyo: Springer.
- McCune-Nicolich, Lorraine. 1981. Toward symbolic functioning: Structure of early pretend games and potential parallels with language. *Child Development* 52(3). 785–797.
- McCune, Lorraine. 1995. A normative study of representational play at the transition to language. *Developmental Psychology* 31(2). 198–206.
- McCune, Lorraine. 2008. *How children learn to learn language*. Oxford, U.K.: Oxford University Press.
- McEwen, Fiona, Francesca Happé, Patrick Bolton, Fruhling Rijdsdijk, Angelica Ronald, Katharina Dworzynski, and Robert Plomin. 2007. Origins of individual differences in imitation: Links with language, pretend play, and socially insightful behavior in two-year-old twins. *Child Development* 78(2). 474–492.
- Meltzoff, Andrew, N. 1988. Infant imitation and memory: Nine-month-olds in immediate and deferred tests. *Child Development* 59(1). 217–225.
- Miyazawa, Kōki, Hideaki Kikuchi, Takahito Shinya and Reiko Mazuka. 2009. *Tai-nyūji-hatsuwa no boin no jikan-kōzō: RIKEN Nihongo boshi taiwa kōpasu o mochiita bunseki* [The dynamic structure of vowels in Infant-directed speech: RIKEN Japanese Mother-Infant Conversation Corpus], *Denshi-jōhō-tsūshin-gakkai Gijutsu-kenkyū-hōkoku* [Technical Report of the Institute of Electronics, Information, and Communication Engineers] 109, no. 308. 67–72.
- Murase, Toshiki, Tamiko Ogura and Yukie Yamashita. 2007. *Yōikusha ni okeru ikujigo shiyō-keikō no kōzō to ikujigo shiyō o kitei-suru yōin* [Baby-talk words in Japanese parents: Structure and motivation for use]. *Shimane-daigaku Hōbun-gakubu Kiyō Shakaibunka-gakka-hen Shakaibunka-ronshū* [Journal of Socio-Cultural Studies: Memoirs of Faculty of Law and Literature, Shimane University], 4. 17–30.
- Ochs, Elinor and Bambi B. Shieffelin. 1984. Language acquisition and socialization: three developmental stories. In Richard A. Shweder and Robert A. LeVine (eds.), *Culture theory: Essays on mind, self and emotion*, 276–320. Cambridge, UK: Cambridge University Press.
- Ogura, Tamiko. 1991. A longitudinal study of the relationship between early language development and play development. *Journal of Child Language* 18(2). 273–294.
- Ogura, Tamiko. 2006. How the use of 'non-adult words' varies as a function of context and children's linguistic development. In Mineharu Nakayama, Masahiko Minami, Hiromi Morikawa, Kei Nakamura and Hidetoshi Shirai (eds.), *Studies in Language Sciences* 5, 103–120. Tokyo: Kurosio Publishers.
- Ogura, Tamiko, Philip S. Dale, Yukie Yamashita, Toshiki Murase, and Aki Mahieu. 2006. The use of nouns and verbs by Japanese children and their caregivers in book-reading and toy-playing contexts. *Journal of Child Language* 33(1). 1–29.
- Ogura, Tamiko, Shoji Itakura, Aya Kutsuki, Misa Kuroki, and Sonoko Egami. 2008. The relationship between imitation types and language development. Poster presented at XVIth International Conference on Infant Studies, Vancouver, Canada, March 27–29.
- Ogura, Tamiko, Yoshie Yoshimoto, and Minori Tsubota. 1997. *Hahaoya no ikujigo to kodomo no gengo hattatsu, ninchū hattatsu* [Baby talk and children's linguistic and cognitive development]. *Kobe-daigaku hattatsukagaku-bu kenkyū Kiyō* [Bulletin of the Faculty of Human Development, Kobe University] 5. 1–14.
- Ogura, Tamiko and Toru Watamaki. 2004. *Nihongo Makkāsā nyūyōji gengo hattatsu shitsumonshi: go to miburi tebiki* [Technical manual of the Japanese MacArthur communicative development inventory: Words and Gestures]. Kyoto: Kyoto Kokusai Shakai Fukushi Sentā [Kyoto International Social Welfare Exchange Center].

- Ogura, Tamiko, Toru Watamaki, and Philip S. Dale. 2008. Nichibei no kodomo no goi hattatsu ni okeru kyōtsūsei to sai [Cross-linguistic study of early lexical development in Japanese-speaking and American English-speaking children]. *Proceedings of the 10th Annual International Conference of the Japanese Society for Language Sciences*, 97–100.
- O'Toole, Ciara and Shula Chiat. 2006. Symbolic functioning and language development in children with Down syndrome. *International Journal of Language & Communication Disorders* 41(2). 155–171.
- Papaeliou, Christina F. and Leslie A. Rescorla. 2011. Vocabulary development in Greek children: a cross-linguistic comparison using the language development survey. *Journal of Child Language*. 38(4). 1–27.
- Piaget, Jean. 1971. *Biology and knowledge*. Chicago: University of Chicago Press.
- Rogers, Sally, J. and Justin H. G. Williams. 2006. *Imitation and the social mind: Autism and typical development*. New York: Guilford Press.
- Soderstrom, Melanie. 2007. Beyond babytalk: Re-evaluating the nature and content of speech input to preverbal infants. *Developmental Review* 27(4). 501–532.
- Szagun, Gisela, Claudia Steinbrink, Melanie Franik, and Barbara Stumper. 2006. Development of vocabulary and grammar in young German-speaking children assessed with a German language development inventory. *First Language* 26(3). 259–280.
- Tardif, Twila, Susan A. Gelman and Fei Xu. 1999. Putting the “noun bias” in context: A Comparison of English and Mandarin. *Child Development* 70(3). 620–635.
- Thiessen, Erik D., Emily A. Hill and Jenny R. Saffran. 2005. Infant-directed speech facilitates word segmentation. *Infancy* 7(1). 53–71.
- Toda, Sueko, Alan Fogel and Masatoshi Kawai. 1990. Maternal speech to three-month-old infants in the United States and Japan. *Journal of Child Language*. 17(2). 279–294.
- Tomasello, Michael. 1999. *The cultural origins of human cognition*. Cambridge, MA: Harvard University Press.
- Tomasello, Michael. 2003. *Constructing a language: A usage-based theory of language acquisition*. Cambridge, MA: Harvard University Press.
- Tomasello, Michael. 2006. The social-cognitive bases of language development. In Keith Brown (ed.), *Encyclopedia of Language & Linguistics*, 2nd edn. 459–462. Oxford: Elsevier.
- Toth, Karen, Jeffery Munson, Andrew N. Meltzoff, and Geraldine Dawson. 2006. Early predictors of communication development in young children with autism spectrum disorder: joint attention imitation, and toy play. *Journal of Autism and Developmental Disorders* 36(8). 993–1005.
- Watamaki, Toru and Tamiko Ogura. 2004. *Nihongo Makkāsā nyūyōji gengo hattatsu shitsumonshi: go to bumpō tebiki*. [Technical manual of the Japanese MacArthur communicative development inventory: Words and grammar]. Kyoto: Kyoto Kokusai Shakai Fukushi Sentā [Kyoto International Social Welfare Exchange Center].
- Yoshida, Hanako. 2012. A cross-linguistic study of sound symbolism in children's verb learning. *Journal of Cognition and Development* 13(2). 232–265.

Etsuko Haryu

2 Literacy acquisition in Japanese children

1 Introduction

Children first learn a language in its oral form, by listening to and analyzing speech people around them produce. Children then proceed to acquire literacy. In order to learn how spoken words correspond to written words, children need to analyze speech into phonological units that should be mapped to units of written language. Furthermore, written language makes it possible for us to *see* written thoughts or stories as an object. In this respect, being literate implies not only being able to read and write, but also being able to handle written ideas, events, or stories.

This chapter discusses Japanese-speaking children's literacy acquisition, especially focusing on the process of learning to read. After a brief description of the three orthographies of written Japanese, *hiragana* and *katakana* syllabaries and *kanji* (Chinese) characters, I trace the process of children's letter-acquisition by focusing on (1) children's awareness to letters before they begin to read (emergent literacy), (2) their learning of the individual letters of *hiragana*, which are usually acquired earliest among the three orthographies, and (3) their becoming able to read written words and sentences. After describing these three phases of letter learning, I will discuss the sociocultural context that guides Japanese children to master *hiragana* letters, and the by-products of literacy acquisition; how processing of spoken Japanese is influenced by the acquisition of *hiragana*, and with what devices written language invites children to an alternative reality which is separated from the *here and now*, and further to logical thinking based on the given premises and conditions.

2 Three orthographies in written Japanese

Japanese has three orthographies: two different *kana* syllabaries (*hiragana* and *katakana*) and Chinese characters (*kanji*). *Hiragana* and *katakana* have the same number of letters, seventy-one, because each *hiragana* letter has its counterpart in *katakana* orthography (see Table 1 for the 71 *hiragana* letters).

These two *kana* syllabaries have an identical structure except that *hiragana* letters usually have cursive forms such as あ, which represents the phoneme /a/, and ん representing /re/, whereas *katakana* has block forms such as ア for /a/ and レ for /re/. Owing to the identical structure of the *hiragana* and *katakana* orthographies, descriptions about *hiragana* can be usually applied to *katakana*.

Table 1: List of 71 Hiragana Letters

base letters					dakuten-attached letters					han-dakuten-attached letters				
あ	い	う	え	お										
a	i	u	e	o										
か	き	く	け	こ	が	ぎ	ぐ	げ	ご					
ka	ki	ku	ke	ko	ga	gi	gu	ge	go					
さ	し	す	せ	そ	ざ	じ	ず	ぜ	ぞ					
sa	si	su	se	so	za	zi	zu	ze	zo					
た	ち	つ	て	と	だ	ぢ	づ	で	ど					
ta	ti	tu	te	to	da	ji	zu	de	do					
な	に	ぬ	ね	の										
na	ni	nu	ne	no										
は	ひ	ふ	へ	ほ	ば	び	ぶ	べ	ぼ	ぱ	ぴ	ぷ	ぺ	ぽ
ha	hi	hu	he	ho	ba	bi	bu	be	bo	pa	pi	pu	pe	po
ま	み	む	め	も										
ma	mi	mu	me	mo										
や		ゆ		よ										
ya		yu		yo										
ら	り	る	れ	ろ										
ra	ri	ru	re	ro										
わ		を		ん										
wa		o		n										

Of the seventy-one letters in the *hiragana* orthography (and also in the *katakana* orthography), six letters correspond to five vowels (/a/, /i/, /u/, /e/, and /o/; there are two letters to represent the vowel /o/, お and を), respectively, 64 letters each represent different CV syllables, and the last one letter represents the nasal coda /N/. As suggested by the existence of the letter representing the nasal coda, each *hiragana* letter corresponds to a mora rather than a syllable. Morae, i.e., temporal units, are basic phonological units to describe the Japanese language (e.g., Kubozono 1989; McCawley 1978). The rhythm of Japanese is mora-based, not syllable-based. Each mora takes approximately the same length of time in speech, and a *hiragana* letter is usually used to represent a mora.¹ Due to this property, there are three kinds

¹ Exceptions to the principle of one-to-one mapping between a *hiragana* letter and a mora are CCV morae whose second consonant is a glide (e.g., /kya/). CCV morae are regarded as one mora, but are represented using two *hiragana* letters, usually combining a CV letter representing the first consonant as the first letter, and as the second letter a CV letter whose pronunciation begins with a consonant /y/, i.e., や /ya/, ゆ /yu/, or よ /yo/. For example, the mora /kya/ is written using two *hiragana* letters as in きゃ. Children usually learn to read letter strings for CCV morae after they learn letters for ordinary morae, i.e., V or CV.

of unique letter-sound correspondences in *hiragana* writing, which might not have existed if *hiragana* had been a syllabary literally.

First, *hiragana* has the letter ん that represents the nasal coda /N/, since in Japanese the nasal coda is regarded as one mora. Second, long vowels are discriminated from short vowels, because the former consists of two morae whereas the latter consists of one mora. This means that two *hiragana* letters are used to describe a long vowel while a short vowel is represented using only one letter. For example, the two words *o-baa-san* ‘grandmother, or an old woman’ and *o-ba-san* ‘auntie, or a middle-aged woman’ are discriminated in Japanese since the length of the second syllable differs between the two words. That is, the second syllable of the word *o-baa-san* consists of two morae, and is written using two letters, ば /ba/ and あ /a/, while the second syllable of the other word ‘*o-ba-san*’ is written using only one letter ば. Third, syllables that have a geminate stop coda consonant are discriminated from ordinary syllables, since a geminate stop consonant is regarded as a mora on its own and is represented using a small-sized letter つ, which is pronounced as /tu/ when it is used in its regular size. Hence, the word /neQko/ ‘roots of plants’ has a different meaning from another word /neko/ ‘cat’. In this case, the word /neQko/ is written using three letters, i.e., ね representing /ne/, つ (a small-sized letter for っ) representing /Q/, and こ representing /ko/, while the other word /neko/ is described using two letters, i.e., ねこ.

Seventy-one *hiragana* letters can indeed be constructed from 46 base letters and two special marks (This is also the case with *katakana*). This is because, in the *hiragana* orthography, CV mora with voicing contrasts such as /ga/ and /ka/ are written using the same base letter, and discriminated from each other by attaching or not a special mark called *dakuten*. For example, the base letter か represents the pronunciation /ka/ on its own. When a special mark called *dakuten* ˊ is attached to the upper right corner of the same base letter, we get the resultant letter が, which is pronounced as /ga/. In this way, in the *hiragana* orthography, voicing contrasts are clearly marked by attaching and not attaching *dakuten*. Out of 71 *hiragana* letters, fifteen CV letters have pronunciations that begin with voiceless (unvoiced) consonants: five letters beginning with a consonant /k/, five letters beginning with a consonant /s/, and five letters beginning with a consonant /t/. When *dakuten* is attached to the upper right corner of these letters, the pronunciations of the initial consonants of the resultant letters become voiced.

Furthermore, there are another five CV letters whose pronunciations begin with a consonant /h/. When *dakuten* is attached to these five letters, the beginning consonant changes from /h/ to /b/; the letter は is pronounced as /ha/ and becomes pronounced as /ba/ when the letter gets *dakuten* on its right upper corner as in ば. The relationship between these five letters whose pronunciation begins with the consonant /h/ and their *dakuten*-attached counterparts whose pronunciation begins with the consonant /b/ appears irregular in light of abovementioned 15 letters whose pronunciation becomes voiced when the base letter gets *dakuten*. However, knowing

that Japanese consonant /h/ has historically changed from a consonant /p/ (e.g., Frellesvig, 2010) would help us understand why in the *hiragana* orthography the consonant /h/, not /p/, is paired with the consonant /b/ in terms of attachment of *dakuten*. In modern Japanese, voiceless syllables that begin with the consonant /p/ are represented by attaching another mark called *han-dakuten* ° to the upper right corner of base letters whose pronunciations begin with a consonant /h/. That is, when *han-dakuten* is attached to the basic letter は /ha/, the resultant letter ぱ is pronounced as /pa/. In this way, out of 71 *hiragana* letters, 25 letters are constructed by adding either of two special marks to base letters: 20 letters constructed by combining base letters plus *dakuten*, and 5 letters constructed by combining base letters with *han-dakuten*. As a result, children need to memorize different graphic patterns for 46 (i.e., 71 minus 25) base letters and two special marks to master *hiragana*, from the viewpoint of perceptual learning.

Kanji characters, i.e., Chinese characters, usually have more perceptually complex forms than *hiragana* and *katakana*, and each character has multiple pronunciations, usually two readings: one Japanese reading and another Chinese reading. A Japanese reading usually corresponds to a word on its own. The Chinese reading is mainly used when multiple *kanji* characters of Chinese reading are combined to form a compound noun or verb/adjective stem. For example, the *kanji* character 犬 is pronounced as /inu/ in its Japanese reading and means ‘dog’. When the character is combined with another character in a Japanese reading, e.g., 山 (/yama/, ‘mountain’), it keeps its Japanese reading even in the resultant compound noun, as in 山犬 (/yama-inu/, ‘mountain dog, or wolf’). However, the same character must be pronounced in its Chinese reading as /ken/ when it is combined with another *kanji* character of Chinese reading such as 獵 (/ryoo/, ‘hunting’) to form a compound noun 獵犬 (/ryoo-ken/, ‘hunting dog’).

As mentioned above, the Japanese reading of a *kanji* character usually corresponds to a word, i.e., a meaningful unit of speech, whereas *hiragana* letters correspond to a mora; most of them correspond to a vowel or a consonant-vowel unit. From this point of view, learning to read *kanji* characters appears rather easy compared with learning to read *hiragana* letters, even though the perceptual forms of *kanji* are usually more complex than *hiragana* letters. In fact, previous research has reported that preschoolers easily learn to read *kanji* characters (Steinberg and Oka 1978; Steinberg and Yamada 1977). Furthermore, by controlling the visual complexity of letters, Haryu (1989) found that children more easily and quickly learn to read letters whose pronunciation corresponds to a word than those letters whose pronunciation corresponds to a CV syllable. For example, preschoolers far more quickly learned to name the *kanji* character 鏡 with a word *kagami* ‘mirror’ compared with learning to name the same character with a syllable /ka/.

Japanese children, however, are usually expected to learn *hiragana* before *kanji* for several reasons. First, the number of graphic patterns children need to learn is far fewer for *hiragana* than for *kanji*. In acquiring the *hiragana* orthography, children

need to learn 71 letters, which are constructed by combining 46 base letters and two special marks. In contrast, children are taught about 2,000 *kanji* characters by the time they graduate junior high school, and more than those are used in everyday life.

Second, by using *hiragana* letters, every word and sentences in Japanese can be written, although standard sentences in books and newspapers are usually written by using not only *hiragana*, but also *katakana* and *kanji*. *Kanji* characters are usually used to write content words such as nouns and verb/adjective stems, and *katakana* letters are used to write words of Western origin such as *remon* [lemon] as in レモン. However, what is written using *kanji* and *katakana* can also be written using only *hiragana*, and grammatical particles and verb/adjective inflectional endings must be written by using *hiragana*.

Third, once *hiragana* letters have been acquired, they play a scaffolding role in children's learning of *kanji* characters. This is because *hiragana* letters are used to show how to pronounce unfamiliar *kanji* characters. In fact, in books for children, *kanji* characters are usually accompanied by *hiragana* descriptions of the pronunciation, called *furigana*. *Furigana* are sometimes used in books for adults as well, when there are *kanji* characters that are not familiar to ordinary people. Lastly, *hiragana* letters usually have perceptually simpler forms compared with *kanji*, which results in *hiragana* letters being easier for young children to write than *kanji* characters. For these reasons, most Japanese children usually learn *hiragana* before *kanji*.

3 Learning to read letters

3.1 Before learning to read: Emergent literacy

Japanese children nowadays grow up being surrounded by a great amount of environmental print, i.e., the print on road signs, food packages and other places in the environment. In addition, adults may write something on paper in front of children. As a result, children show rudimentary understanding of reading and writing, which is called emergent literacy, long before they actually begin decoding written words.

In addition, there is now also a big movement in Japan that recommends reading picture books to children from the beginning of their life. This movement called *Book Start* began in Britain in 1992 and was imported to Japan in 2000. Since then, more and more local governments have joined this movement. In areas where local governments have joined this movement, parents are given booklets telling how good book-reading is for infants' development when they see the doctor for a regular checkup of their babies at four or six months of age. As a consequence, it is reported that over 80 percent of parents in urban areas in Japan begin to read books to their baby before the baby's first birthday (e.g., Komae City 2011).

Even before this movement, however, quite a few parents read picture books to their infants from a very early stage of development, and researchers have observed how those children come to be aware of the role of letters in books. For example, Shibasaki (1987) reported that his one-year-old daughter protested him when he deliberately told a different sentence instead of the one written in her favorite book. In fact, she memorized almost all sentences in the book as a consequence of having had adults read the book again and again. She became aware that there were letters besides pictures in the book, and owing to those letters, the story should always be told in the same way, that is, with identical words and sentences.

Children who memorized almost all the sentences in their favorite books begin to pretend reading the book by themselves, even though they cannot read individual letters yet. They know that they should tell the same story with identical sentences whenever they read the same book aloud. In order to fill this condition in their pretend reading, children sometimes ask adults to read the written sentences and check whether the sentences they remember are indeed identical to those written on the page (Furuya 1996). However, at the same time, they know that they do not *read* books in a literal sense. According to Shibasaki (1987), when he saw his three-year-old daughter reading her favorite book aloud, he told her that she was *reading* the book very well. On hearing this, she objected him saying, “I cannot read books yet. I have been just telling the story.” This episode suggests that children begin to understand what reading a book is before they become able to decode written words.

Children see printed words not only in picture books but also on wrappings of snack foods and on shop signs. These printed words usually represent something related to the context. For example, printed words appearing in picture books describe what is happening in the scene, and those on the food packages show the name of the snack food. The letters on shop signs represent what is sold. Children come to know that printed words represent something related to the context and to be able to guess what is written even though they cannot read the constituent letters. Imai (1982) investigated whether preschoolers could use contexts to guess what was written. He presented children with words written in *katakana*, which represented the title of a familiar movie and names of familiar snack foods. There were two conditions: (1) the printed words were presented to children on their own; (2) they were shown by being embedded in the familiar contexts, i.e., the words were shown on a familiar movie posters or food packages. He investigated whether preschoolers could read those printed letters. He also tested how many *katakana* letters the children could read. The results showed that even slow readers who could read only 9 or fewer *katakana* letters could read printed words as successfully as advanced readers who could read more than 9 letters, if and only if the printed words were presented in familiar contexts.

Children’s own names play an interesting role in the beginning phase of *hiragana* acquisition. When children go to a daycare center or kindergarten, they

see their own names written on their towels, bags, storage spaces, and so on. Their names appear so frequently in the environment with their unique perceptual configuration that children are likely to ask adults what those letters refer to. Ōba (1983), who carried out a parent survey that asked questions about preschoolers' interest in letters, found that, by four years of age, 80 percent of children asked their parent what those letters appearing so frequently in a unique perceptual configuration represented. Through such interaction with adults, children associate the whole perceptual pattern, i.e., the cluster of letters, with their own names. Consequently, they become able to decode written forms of their own names even though they have not yet learned the constituent letters. Muto et al. (1992) investigated whether three-year-olds could read their first names written in *hiragana*, and found that half of those children succeeded. What is interesting was that 25 percent of the children, that is, half of the children who failed, gave their *full* names in response, although they were shown only their first names written using *hiragana*. This suggests that not a few children associated the whole perceptual pattern of the letter cluster with their own names.

Before beginning to read individual letters, children are aware of the existence and the role of letters in the environment. They sometimes read written words by utilizing as a cue the contexts in which those letters appear. They also memorize the whole perceptual patterns of a familiar letter cluster, and associate it with a particular word, e.g., their own names. Through these activities, children are motivated and get ready to learn individual letter-sound mappings.

3.2 Learning to read hiragana

How many *hiragana* letters can preschool children read? And in what pace do they acquire those letters? Shimamura and Mikami (1994) investigated this problem by testing about 1,200 four- to six-year-olds in 1988, although the results were reported in 1994. Their results, i.e., percentages of children who could read a particular number of *hiragana* letters in each age group of four, five, and six years, are shown in Figure 1. For four-year-olds, 53.9% were able to read less than five letters, whereas 14.5% could read 60 letters or more out of 71 *hiragana* letters. For five-year-olds, 59.1% could read 60 *hiragana* letters or more, whereas 9.3% could read less than five letters. By six years of age, 89.4% of children become able to read more than 60 *hiragana* letters, suggesting that most children are able to read almost all *hiragana* letters before entering elementary school.

Given that each letter in *hiragana* orthography corresponds to a mora, as mentioned above, the ability to analyze spoken Japanese in terms of morae, i.e., phonological awareness, should help children acquire *hiragana* letters. In order to explore this problem, Amano (1970) tested three- to five-year-olds, using two tasks; a mora segmentation task and a mora identification task. In the mora segmentation

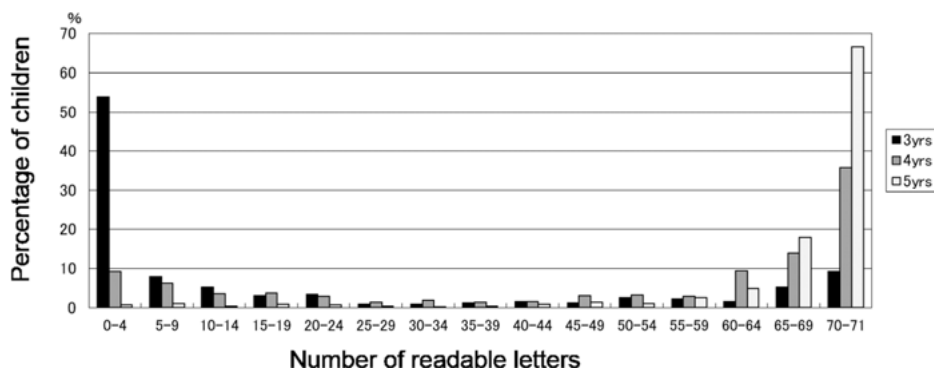


Figure 1: Percentages of four- (ma = 50m), five- (ma = 62m), and six-year-olds (ma = 74m) who could read particular numbers of hiragana letters [created based on Shimamura and Mikami (1994)]

task, the children were asked to segment familiar words into morae. The children were asked to name a picture of a familiar object, and to place small wooden blocks along a horizontal line as many as the number of morae comprising the familiar word. When the children placed the correct number of blocks, they proceeded to the second task, i.e., the mora identification task, in which they were asked to point to the block that represented a particular mora the experimenter presented. In addition to these two tasks, how many *hiragana* letters the children could read was investigated. As shown in Figure 2, Amano found that children's performance on the mora segmentation and mora identification tasks was rapidly improved as the children acquire *hiragana* letters, even though they showed some ability to segment familiar words into morae before they began learning to read *hiragana*. Based on these results, Amano concluded that children establish the ability to analyze phonological structure of words while they learn first 20 to 25 *hiragana* letters, and this ability in turn accelerates their learning of *hiragana*.

Amano's (1970) results suggest that phonological awareness may play a role in children's *hiragana* acquisition. Then, what role? The answer to this question is suggested by Dairoku's (1995) research. He reported that a mentally retarded child who had been taught *hiragana* letters one by one had finally become able to name almost all *hiragana* letters. However, the child failed to match a familiar word written using *hiragana* to its referent, even after he had become able to read almost all *hiragana* letters. That was not because the word was unfamiliar to the child. He could match the same word to its referent when the word was aurally presented. This case suggests that learning to decode individual letters is not enough to read and understand written words. The child appeared to fail to understand that sounds represented by individual letters were building blocks of familiar words.

Dairoku (1995) trained the child for eight months to develop phonological awareness using Amano's (1970) mora segmentation and mora isolation tasks. The child was first given several wooden blocks and asked to place them as many as

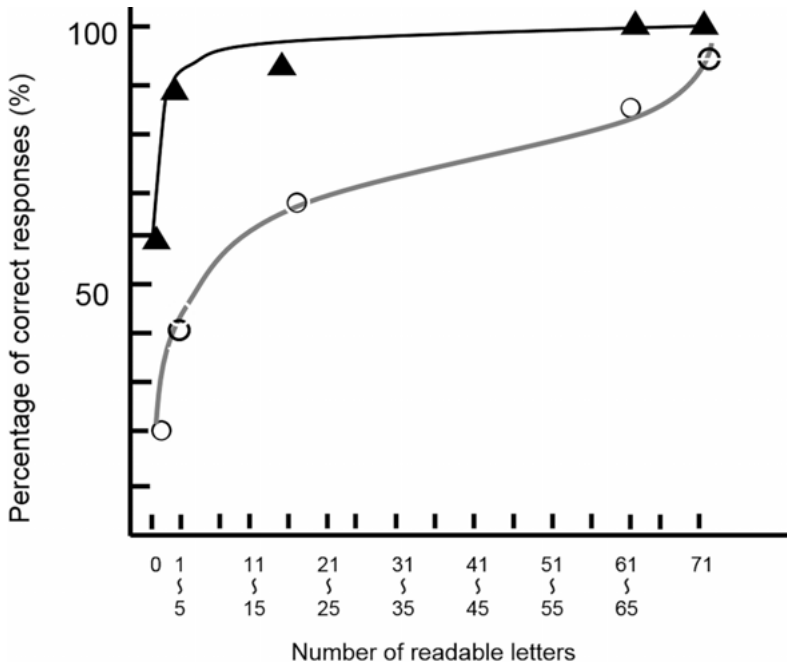


Figure 2: Children's performance (percentages of correct responses) in a) the mora segmentation task (▲-▲) and b) the mora identification task (○-○) as a function of the number of letters they can read [reproduced from Amano (1970)]

the number of sounds making up an aurally presented word. Then, the trainer pointed to one of the blocks that was arranged by the child and asked what sound the block represented. Figure 3 shows the change of the child's performance in the mora segmentation task, the mora identification task, and the written-word comprehension task as a function of the duration (i.e., weeks) of training. The first 5 weeks were the baseline period during which the training was not conducted. After the training began at the sixth week, performance in the mora segmentation task was rapidly improved. However, it took several weeks further before the child began to show some sensitivity to sounds making up aurally presented words. Finally, he became able to match a written word to its referent at about the same time when he achieved perfect performance on the mora isolation task, suggesting that phonological awareness plays an important role in matching written words to spoken forms.

Another aspect of *hiragana* learning that may benefit from phonological awareness is the learning of *dakuten*-attached letters. As mentioned before, when a special mark called *dakuten* "゛" is attached to the upper right corner of a *hiragana* letter that represents a CV syllable beginning with a voiceless consonant, the pronunciation of the initial consonant of this letter becomes voiced. Children usually learn *hiragana* letters without *dakuten* first. After acquiring 30 or more letters without *dakuten*,

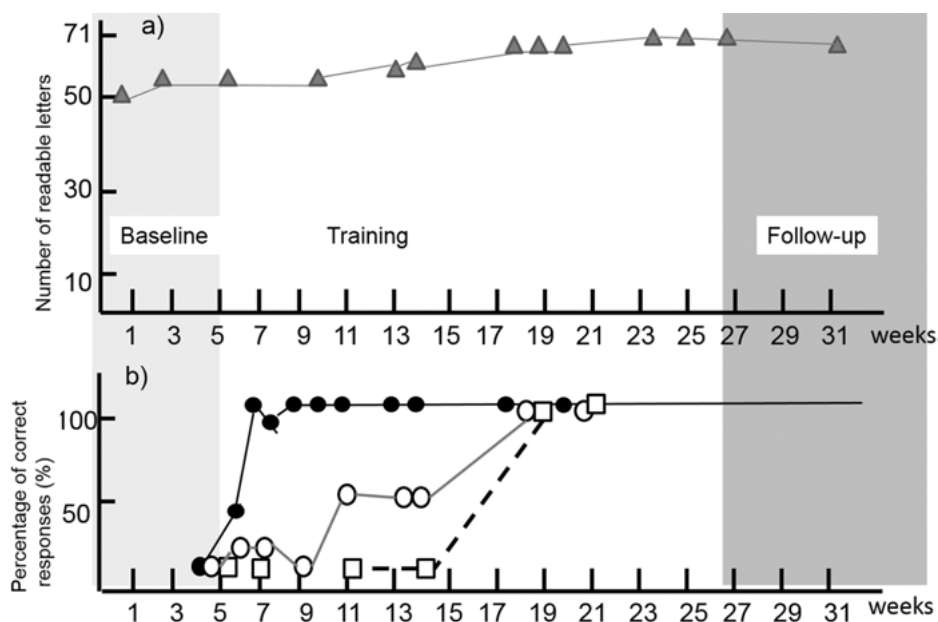


Figure 3: a) number of readable letters and b) percentage of correct responses in the mora segmentation (●-●), the mora identification (○-○) and the two-mora word comprehension (□-□) task as a function of duration of training [reproduced from Dairoku (1995)]

they begin to learn *dakuten*-attached letters (National Language Research Institute, 1972). With knowledge that a pronunciation of a *hiragana* letter becomes voiced when *dakuten* is attached, children could easily learn *dakuten*-attached counterparts of known letters. Kakihana (2005) explored this problem by examining whether children just beginning to acquire *hiragana* letters could discover the correspondence between the pronunciations of letters with and without *dakuten*, and use this knowledge to infer a pronunciation of a new *dakuten*-attached letter whose counterpart letter without *dakuten* was already known. He found that four-year-olds who had already learned a few pairs of letters with and without *dakuten* could do this. However, this seemed difficult for children who had not begun to learn *dakuten*-attached letters yet. The results suggest that children rapidly become aware of correspondence between voiced and voiceless consonants by learning a few *dakuten*-attached letters and come to use this knowledge to learn the remaining *dakuten*-attached letters.

Hiragana letters have pronunciations corresponding to Japanese basic morae, V or CV, which are the building blocks of spoken Japanese. In order to acquire these letters, children need to learn not only individual letter-sound mappings but also how to analyze the phonological structure of spoken Japanese. In the course of *hiragana* acquisition, children may take some time to learn first 20 to 25 letters and to develop phonological awareness. However, once the ability is acquired, children

begin to easily learn letter-sound mappings. Now they can regard a pronunciation of each *hiragana* letter as a part of familiar spoken words.

3.3 From letters to words and sentences

In English, the same letter may be pronounced differently depending on word contexts; for example, the English letter ‘a’ should be pronounced in the same way as its letter name when it appears in a word such as ‘table’, but should be pronounced differently when it appears in words such as ‘walk’ or ‘apple’. In contrast, most Japanese *hiragana* letters have a single pronunciation.² With this transparent correspondence between a letter and its pronunciation, Japanese children may be expected to read and understand written words and sentences as soon as they become able to read *hiragana* letters. The National Language Research Institute (NLRI, 1972) investigated children’s ability to understand written words in relation to the number of letters they could read. Children were shown a word written using *hiragana* letters and asked to point to a referent of the word out of four test pictures. Children who could correctly select a referent picture had already learned more than 20 *hiragana* letters. In contrast, children who could only read 20 letters or fewer tended to fail on this task.

There seem to be at least three requisites children should meet in order to read and understand words written using *hiragana*. First, children need to develop phonological awareness. That is, they must become able to identify a mora represented by each letter as a phonological unit included in familiar words. The importance of this ability is suggested by the aforementioned case with the mentally retarded child who could not understand written words even after having acquired letter-sound correspondences for almost all *hiragana* letters (Dairoku 1995). Second, children need to know letter-sound correspondences for a substantial number of *hiragana* letters, so that they can infer the pronunciation of a written word even when they do not know the pronunciations of all the constituent letters. Third, in order to understand written words, children must decode letters quickly so that they can easily identify the decoded sound cluster as a word whose aural form is familiar to them (Perfetti 1986). Akita et al. (1995) analyzed the way in which three- to five-year-old children read aloud a storybook, and these researchers found that it changed from reading letter by letter to reading word by word at around the time of acquiring 20 to 25 letters. This suggests that it is at around this time that they become able to decode each letter quickly enough to identify a sound cluster as a familiar word.

² Two letters, ‘は’ and ‘へ’, are exceptions to this principle. The letters ‘は’ and ‘へ’ are usually pronounced as /ha/ and /he/, respectively. However, these are pronounced as /wa/ and /e/, respectively, when they are used to represent grammatical particles.

Then, do children easily understand written sentences as soon as they become able to understand written words? NLRI (1972) also investigated children's abilities to understand written sentences in relation to the number of readable letters. Children were presented with a written sentence, which directed them to do some behavior such as "pick up a small wooden block and put it on the paper". Children were checked on whether they would correctly enact the sentence. Children who had just mastered letter-sound correspondences for all the 71 *hiragana* letters could perform the written sentence enactment task correctly only about 50% of the time. The results showed that children need some more time to develop the ability to understand written sentences after they have learned to decode all the 71 *hiragana* letters.

Why do children have such difficulty in understanding written sentences even after they have learned letter-sound correspondences for all *hiragana* letters? For one thing, in order to understand written sentences, children need to identify words included in the sentence quickly. In particular, the ability to identify a letter cluster as a familiar word is important for understanding written Japanese, in which words are not separated from each other, i.e., there are no space inserted between words. Children may take some time to become expertise in identifying a letter cluster as a familiar word after they have mastered all *hiragana* letters. Takahashi (1996) investigated whether children who could identify written words quickly would understand written sentences well, by testing children at the end of their first grade year. The time children needed to read aloud written words (i.e., response latency) was measured as an index of their expertise in identifying written words. Takahashi found that the faster the children could decode written words, the better they understood written sentences.

In the process of parsing written Japanese into words, it is also important to quickly identify grammatical particles. In order to investigate whether children are able to do this, we can focus on whether they are able to assign proper pronunciations to two exceptional *hiragana* letters, 'は' and 'へ.' Although other *hiragana* letters have only a single pronunciation each, these two letters have two pronunciations, respectively. One is an ordinary pronunciation, /ha/ for 'は' and /he/ for 'へ'. The other pronunciations, /wa/ for 'は' and /e/ for 'へ', are used when the letters represent grammatical particles. Therefore, by examining whether children properly read these two letters depending on the context, we can infer whether they are able to quickly discriminate grammatical particles from content words in written sentences. Akita and Hatano (1999) examined whether five- and six-year-old children could read these two letters appropriately depending on the context. They found that the children who had just mastered letter-sound correspondences for 46 base letters³ had difficulty in assigning pronunciations to these letters properly.

³ Out of the 71 letters in *hiragana* orthography, 25 letters are constructed by combining a base letter and a special mark, *dakuten* or *han-dakuten*. Therefore, the remaining 46 letters can be called base letters or basic letters.

Even after children mastered letter-sound correspondences for all *hiragana* letters, skills of identifying content words and grammatical particles in their written forms continue to improve, which contribute to better comprehension of written text. What is interesting is that the time children require to read aloud nonsense words remains the same level after their mastery of *hiragana* letters, while the time they need to read aloud familiar words is gradually shortened (Takahashi 1996). In addition, how quickly children could read aloud nonsense words was not related to their ability of text comprehension (Takahashi 1996). These findings suggest that, once children learned letter-sound correspondences for all letters, it is not the skill of decoding individual letters but the skill of identifying written forms of familiar words that plays an important role in their text comprehension. Furthermore, according to Takahashi (2001), who conducted a longitudinal study on children from their first to fifth grade, contribution of written-word identification skill to text comprehension disappeared by the time children became fifth graders. In young children who have just learned letters, how skillful they are at decoding written words directly influences text comprehension. However, the relation becomes to be weakened as the decoding process is automatized.

4 Socio-cultural contexts that guide children to learn to read

Shimamura and Mikami (1994) surveyed about 1200 children and found that 89.4% of six-year-olds could read almost all *hiragana* letters (more than 60 letters out of 71). This result indicates that most children have acquired almost all *hiragana* letters before entering elementary school. However, this appears not to be because children are taught how to read letters explicitly. Most Japanese mothers tell that their children have become able to read letters *naturally by themselves* (Azuma 1994). Certainly, there is now a movement in Japan that persuades parents to read picture books to infants, and this must provide children with an opportunity to become interested in letters. However, when reading books to their children, parents do not always want their children to learn letters. Akita and Muto (1996) asked mothers of three- to six-year-olds who lived in Tokyo why they read books to children, and found that most mothers wanted to enjoy conversation with their children sharing a fantasy world of the book rather than wanting their children to learn letters. Mothers think that creating a rich environment that stimulates children's interest in letters is more important than teaching children to read explicitly.

Regarding formal education, although more than 99 percent of five-year-olds (OECD 2012) attend either kindergartens or daycare centers in Japan, it is not so usual for children to be explicitly taught reading and writing in those educational settings. According to the nationwide survey conducted by Benesse Educational

Research and Development Center (BERD), children are systematically taught to read in 32.3% of kindergartens and 33.1% of daycare centers (BERD 2009). These figures are not so low, but they are not high enough to explain the high rate of children who have become able to read almost all *hiragana* letters before entering elementary school. In kindergartens and daycare centers, teachers indeed actively create rich environments that stimulate children's interest in letters, rather than teach children letters explicitly. Children's names and their portrait pictures are shown at their birth month on the wall of the classroom. Children's paintings or handcrafts are often displayed in the classroom with their names and some explanations, which are of course written by using *hiragana* letters (Muto et al. 1992).

Furthermore, children may be helped to develop phonological awareness by traditional games such as *karuta* and *shiritori*. *Karuta* is a game using cards similar in appearance to baseball cards. The *karuta* cards usually consist of 46 pairs of picture and sentence cards, which correspond to the 46 *hiragana* base letters. On a sentence card is usually written a three-line poem, proverb, or quiz that suggest a particular object or event, which is depicted on the corresponding picture card together with the first letter of the name of the object or event. All the picture cards are aligned in front of participants. The leader of the game reads aloud a sentence card one by one, and participants must find and pick up a corresponding picture card as soon as possible. The one who collects the largest number of picture cards wins the game. Children are able to find an appropriate card by attending to the picture depicted on it, even though they cannot segment the first syllable of the object name. However, once children successfully select an appropriate card using the picture on it, this in turn provides them with an opportunity to look at the letter on the card, which corresponds to the first syllable of the object name.

Shiritori is a word game played by multiple people. In this game, participants must say a word which begins with the same mora, i.e., V or CV, as the last one of the word the preceding participant said. For example, if the first participant said the word *suika* 'watermelon', the second participant must find a word that begins with the syllable /ka/, i.e., the last mora of the word *suika*. If the second participant said the word *karasu* 'crow', then the next participant must find and answer with a word which has not yet been said in the present game and which begins with the mora /su/. In this way, the game continues as long as participants answer with an appropriate word in turns. A participant who cannot find an appropriate word loses and the game ends. In order to play *shiritori*, children need to segment the last mora of the given word and to find a different word that begins with that mora. This requires the very ability that is called phonological awareness. In fact, how well children play this game is correlated with the number of *hiragana* letters they can read (Takahashi 1997). However, even children who cannot segment words into mora by themselves are able to play this game by being given cues to a word they should answer; for example, they may be told to think about a black bird that caws when *karasu* 'crow' is an appropriate word to answer.

As seen so far, Japanese children are not only immersed in a rich environment that *naturally* guides them to be interested in letters, but also join activities that foster phonological awareness which may directly facilitate their *hiragana* acquisition. These should explain the high rate of children who can read almost all *hiragana* letters before entering elementary school, despite the relatively low number of parents and teachers who answer that they actively teach their children how to read.

5 Influences of written language on auditory language processing

Once orthographical knowledge is acquired, it affects recognition of spoken language. For example, English-speaking adults' performance in a rhyme-monitoring task is affected by the knowledge of how to spell those words. In this task, participants are presented with a list of words aurally and asked to choose one that rhymes with a cue word which is also aurally presented. English-speaking adults respond faster when the cue word and the to-be-answered word are orthographically similar (e.g., pie-tie) compared to when they are dissimilar (e.g., rye-tie) (e.g., Seidenberg and Tanenhaus 1979). Furthermore, those who have learned alphabetical writing are able to manipulate fine phonological units such as consonants, although those who are illiterate segment words at most based on syllables (e.g., Morais et al. 1986).

Likewise, acquisition of *hiragana* in which each letter corresponds to a mora rather than to a syllable influences how children segment words into phonological units. As mentioned before, in Japanese, long vowels are discriminated from short vowels; the former consists of two morae and is written using two letters while the latter is regarded as one mora and written using one letter. Although children who have not learned *hiragana* yet appear to discriminate between words that differ only in the length of a particular vowel such as *o-baa-san* 'grandmother, or old woman' versus *o-ba-san* 'auntie, or middle-aged woman', the way in which they segment words into phonological units is not stable; when they are given a doll and asked to jump as many times as the number of sounds that constitute given words, children who have just begun to learn *hiragana* segment words sometimes based on syllables and in other times based on morae. However, children who mastered *hiragana* segment words including the nasal coda and long vowels mainly based on morae (Inagaki, Hatano, and Otake 2000). This suggests that how to segment words into phonological units is influenced by the writing system children acquire.

Furthermore, acquisition of *hiragana* appears to facilitate the formation of symbolic images of voiced and voiceless consonants in Japanese. In Japanese many pairs of onomatopoetic words differ only in whether the word begins with a voiced consonant or a voiceless one, such as *don* versus *ton*, and *gatyān* versus *katyān*.

In such pairs, both words are used to describe sounds produced in almost the same situation, although the word beginning with a voiced consonant represents louder and lower-frequency sounds produced by a larger object, and the other that begins with a voiceless consonant represents quieter and higher-frequency sounds produced by a smaller object. For example, both *don* and *ton* can refer to sounds of drums, although *don* represents a louder and lower-frequency sound produced by a larger drum, and *ton* refers to a quieter and higher-frequency sound from a small drum. Japanese-speaking adults honor this principle not only in producing and understanding known onomatopoeic words, but also in interpreting novel onomatopoeic words with voicing contrast (Haryu and Zhao 2007). This is not because matching voiced/voiceless consonants with a loud/quiet sound from a large/small object, respectively, is guided by universal sound symbolism; Chinese speakers without knowledge of the Japanese language do not always match words beginning with a voiced/voiceless consonant with a loud/quiet sound from a large/small object, respectively, when speech sounds were presented with sound properties such as intensity and mean fundamental frequencies controlled (Haryu and Zhao 2007). Japanese children develop sensitivity to this principle as they grow up in the environment in which Japanese is used (Haryu 2010).

The acquisition of *hiragana* appears to play some role in the formation of this Japanese-specific *sound symbolism* which matches voicing contrasts of speech sounds to image contrasts of large-loud versus small-quiet. This prediction is related to the fact that, in the *hiragana* orthography, correspondences between voiced and voiceless consonants are clearly shown by attaching or not attaching *dakuten* to a letter. This property of the *hiragana* orthography may help children notice that there are quite a few pairs of onomatopoeic words with voicing contrasts and that in those pairs the word beginning with a voiceless consonant refers to quieter and higher-frequency sounds from a smaller object while its counterpart beginning with a voiced consonant refers to louder and lower-frequency sounds from a larger object. In fact, children who have not yet learned any *dakuten*-attached letters are less likely to apply this principle in interpreting novel onomatopoeic words with voicing contrast, compared to those children who already know at least one *dakuten*-attached letter⁴, although application of the principle to known onomatopoeic words did not differ between the two groups of children (Haryu 2010). Thus, knowledge of orthography appears to guide us not only to reanalyze spoken words, but also to develop language-specific sound symbolism.

⁴ Children usually learn letters without *dakuten* first, and it is after they acquire substantial number of letters without *dakuten* that they begin to learn *dakuten*-attached letters. This means that, when children learn the first *dakuten*-attached letter, they usually already know its counterpart letter without *dakuten*.

6 Getting used to the decontextualized nature of written language

As seen so far, acquisition of letters affects recognition of phonological units of spoken language, and sometimes contributes to the formation of images that phonemes have for speakers of the language. However, being literate means not only knowing letters but also being able to handle decontextualized language. That is, in order to understand a written text, we need to separate the world described by the text from the *here and now* and to consider that things in that world would develop based on the conditions and premises stated in the text.

Children experience this aspect of written language from very early on in the context of picture-book reading. In picture-book reading, children are guided by the text to construct in their mind an imaginary world, which is separated from the here and now. In Japanese picture-book reading situations in particular, there are some cues to help children separate the imaginary world from the here and now. First, there are some ritual phrases that signal the beginning and the end of the story; “*Hazimari, hazimari*” for the beginning and “*Osimai*” for the end. Adults usually say these phrases with unique prosody when they read books to children, signaling that what is told between these phrases is about an alternative reality. In fact, these ritual phrases and their unique prosody are among what children acquire the earliest in the activity of picture-book reading. Furuya (1996) reported that her two-year-old daughter used these phrases in pretending to read a picture book.

In addition, there are some types of sentence-final expressions that are more likely to be used in written texts than in spoken language. In books for young children, sentences usually end with politeness suffixes such as *-mas* (*-masu* for a non-past form and *-masita* for a past form) and *-des* (*-desu* for a non-past form and *-desita* for a past form). This contrasts with the fact that sentence-final particles such as *yo* and *ne* are usually used in casual conversation which takes place typically between mother and child. Use of politeness suffixes such as *-mas* and *-des* shows that what is told now belongs to the imaginary world, not to the real world. Children begin to use sentence-final expressions with these politeness suffixes when they pretend to read books at 2 years of age (Furuya 1996), and by 4 years of age become able to appropriately use these two types of sentence-final expressions, i.e., the sentence-final particles and the politeness suffixes, depending on whether what is being told now pertains to an imaginary world or to the here and now (Nishikawa 1995).

In picture-book reading, children can use ritual phrases and sentence-final expressions as cues to discriminating a fantasy world from the real world and to tracking event development within the framework of the fantasy world. However, thinking based on the given premises is important not only in picture-book reading but also in logical reasoning. In deductive reasoning, we must draw conclusions by attending

to the formal relations among the given premises without regard to the empirical truth of those premises. According to Inhelder and Piaget (1958: 342), the ability to perform such logical reasoning is characteristic of adolescents and enables them “to escape the concrete present toward the realm of the abstract and the possible”, whereas such logical reasoning is difficult for younger children. In fact, several studies have demonstrated that such logical reasoning is difficult for preschoolers (e.g., Hawkins et al. 1984) and for unschooled adults from “traditional” and “nonliterate” societies (e.g., Luria 1976; Scribner and Cole 1981), especially when the premises are incongruent with their empirical knowledge. For example, preschoolers who were given premises such as “All cats bark. Rex is a cat” are reluctant to draw a logical conclusion such as “Rex barks” (Dias and Harris 1988). More and more recent studies, however, have revealed under what conditions even young children successfully perform deductive reasoning based on the premises incongruent with their real-world knowledge; when they are instructed to imagine that those premises were true on another planet (Dias and Harris 1988, 1990; Richards and Sanderson 1999), and when they are told that the experimenter wanted those odd premises to be accepted as a basis for reasoning (Leevers and Harris 1999). Picture-book reading, which requires children to think about the imaginary world based on the given premises, provides them with the opportunities to suspend attention to the real world and to think within the framework of given premises. In this respect, children have been trained to perform logical reasoning even when the premises run counter to their empirical knowledge, by joining picture-book reading, i.e., activities in which written texts play a central role.

7 Conclusion

Japanese children become able to read almost all the *hiragana* letters before entering elementary school. This appears not to be because adults explicitly teach children to read. The relatively transparent relationship between letter and sound in the *hiragana* orthography probably contributes to this. Each letter usually has a single pronunciation, which corresponds to a basic mora in Japanese, i.e., V or CV. What is more important, however, is that children are surrounded with a rich environment that motivates them to learn letters. Children observe adults reading and writing. Written and printed words are seen everywhere in their lives, e.g., on picture books, on packages of snack food, and on shop signs. There are some traditional games such as *shiritori* and *karuta*, which may contribute to developing phonological awareness and help children learn letter-sound correspondences in *hiragana*.

Among others, picture-book reading provides children with opportunities not only to notice the role of letters, but also to face a written text. Understanding and producing written texts require us to handle decontextualized language or decontextualized/

detached abstract thinking. In understanding a text, we sometimes need to suspend our empirical knowledge and to predict the future development of the text based on the conditions given in the text. In picture-book reading situations, preschool children are trained to handle decontextualized language. On the other hand, in producing a text, we need to carefully choose to-be-described information and arrange the order and structure so that readers who may not share the here and now with us can understand it. This is also necessary in the case in which we *talk* to others who do not share experience or knowledge with us. That is, decontextualized nature of language is observed not only in understanding and producing written texts, but also in oral communication in the classroom and between people without much common, shared knowledge. In this respect, even though most preschool children have difficulty in writing, they have more and more opportunities to produce decontextualized language. In kindergartens or daycare centers, they are sometimes asked to talk what they did during the last holidays to their classmates as an audience. How teachers of kindergartens and elementary schools help children to talk in such formal settings has begun to be reported (Fujisaki 1982; Shimizu and Uchida 2001). Preschool children still have difficulty in telling a story by themselves to multiple children as an audience, and teachers help them by asking what, when, and where the child did on the holiday. In this way, children appear to learn what they should refer to when they talk about their experiences to people who does not share them. However, the data on the development of producing decontextualized language is still sparse. How do children learn to produce decontextualized language? How do adults help their development in this respect? Does children's experience with written texts such as book reading contribute to their learning how to talk in such formal situations? If so, how? These interesting topics remain to be investigated in future research.

Acknowledgments

Part of this work was supported by the Japan Society for the Promotion of Science (JSPS) Grant-in-Aid for Scientific Research (B) no. 20330135 and 25285183.

References

- Akita, Kiyomi and Giyoo Hatano. 1999. Learning to read and write in Japanese. In Margaret Harris and Giyoo Hatano (eds.), *Learning to read and write*, 214–234. New York: Cambridge University Press.
- Akita, Kiyomi and Takashi Muto. 1996. Yōji e no yomikikase ni taisuru hahaoya no kangae to dokushokankyō ni kansuru kōdō no kentō [Why do mothers read picture-books to their children? Mothers' conceptions and their setting environment on reading]. *Kyōiku-shinrigaku-kenkyū* 44(1). 109–120.

- Akita, Kiyomi, Takashi Muto, Makiko Fujioka and Katsuo Yasumi. 1995. Yōji wa ika ni hon o yomu-ka? Kana-moji no shūtoku to yomikata no kanrensei no jūdanteki-kentō [The development of children's reading of story books: A longitudinal study of relations between the acquisition of kana-letters and book reading]. *Hattatsu-shinrigaku-kenkyū* 6(1). 58–68.
- Amano, Kiyoshi. 1970. Go no on'in-kōzō no bunseki-kōi no keisei to kana-moji no yomi no gakushū [Formation of the act of analyzing phonemic structure of words and its relation to learning Japanese syllabic characters (kana-moji)]. *Kyōiku-shinrigaku-kenkyū* 18(2). 76–89.
- Azuma, Hiroshi. 1994. *Nihonjin no shitsuke to kyōiku: hattatsu no nichibei-hikaku ni motozuite* [Education and socialization in Japan: A comparison between Japan and the United States]. Tokyo: University of Tokyo Press.
- Benesse Educational Research and Development Center. 2009. *Dai-ikkai yōji-kyōiku hoiku ni tsuite no kihon chōsa hōkokusho* [Report of the first basic survey on kindergartens and daycares]. Retrieved from <http://benesse.jp/berd/dataclip/clip0012/index4.html> on 12 Mar. 2013. (In Japanese)
- Dairoku, Hitoshi. 1995. Mōra ni taisuru ishiki wa kana-moji no yomi shūtoku no hitsuyō-jōken ka? [Is awareness of morae a requisite for acquisition of kana reading?]. *Shinrigaku-kenkyū* 66(4). 253–260.
- Dias, M. G. and Paul L. Harris. 1988. The effect of make-believe play on deductive reasoning. *British Journal of Developmental Psychology* 6(3). 207–221.
- Dias, M. G. and Paul L. Harris. 1990. The influence of the imagination on reasoning by young children. *British Journal of Developmental Psychology* 8(4). 305–317.
- Frellesvig, Bjarke. 2010. *A history of the Japanese language*. Cambridge, UK: Cambridge University Press.
- Fujisaki, Haruyo. 1982. Yōji no hōkoku-bamen ni okeru keikakuteki-kōsei no hattatsuteki-kenkyū [The developmental study of the planned organization in children's reporting situations]. *Kyōiku-shinrigaku-kenkyū* 30(1). 54–63.
- Furuya, Kimiyo. 1996. Yōji no ehon-yomi-bamen ni okeru “katari” no hattatsu to tōjō-jinbutsu to no kankei: ni-sai kara yon-sai made no jūdanteki jirei-kenkyū [Development of storytelling: Children's first reading of books]. *Hattatsu-shinrigaku-kenkyū* 7(1). 12–19.
- Haryu, Etsuko. 1989. Yōji ni okeru kanji to hiragana no dokuji-gakushū: sono shidō-hōhō ni tsuite no kentō [What facilitates learning to read characters by children?]. *Kyōiku-shinrigaku-kenkyū* 37(3). 264–269.
- Haryu, Etsuko. 2010. Yōji ni okeru giongo no rikai: dakuon-moji chishiki no eikyō ni chūmoku shite [Children's understanding of the symbolic values of Japanese onomatopoeia: Contribution of knowledge about orthography]. *Kyōiku-shinrigaku-kenkyū* 58(3). 275–284.
- Haryu, Etsuko and Lihua Zhao. 2007. Yūseion to museion o daishō ni taiōzureru kankaku no kigen: giongo rikai no nitchū-hikaku [Understanding the symbolic values of Japanese onomatopoeia: Comparison of Japanese and Chinese speakers]. *Shinrigaku-kenkyū* 78(4). 424–432.
- Hawkins, J., R. D. Pea, J. Glick and Sylvia Scribner. 1984. “Merds that laugh don't like mushrooms”: Evidence for deductive reasoning by preschoolers. *Developmental Psychology* 20(4). 584–594.
- Inhelder, Bärbel and Jean Piaget 1958. *The growth of logical thinking from childhood to adolescence: An essay on the construction of formal operational structures*. London: Routledge & Kegan Paul.
- Imai, Yasuchika. 1982. Yōji no yomi ni oyobosu kankyōteki-myakuraku no kōka [Effect of the environmental context on reading in preschool children]. *Dokusho-kagaku* 26(4). 155–161.
- Inagaki, Kayoko, Giyoo Hatano and Takashi Otake. 2000. The effect of kana literacy acquisition on the speech segmentation unit used by Japanese young children. *Journal of Experimental Child Psychology* 75(1). 70–91.

- Kakihana, Shinichiro. 2005. Dakuon-moji shūtoku ni okeru ruisui no yakuwari [Role of analogy in learning to read Japanese syllabic characters with voiced consonants (“daku-on” characters)]. *Kyōiku-shinrigaku-kenkyū* 53(2). 241–251.
- Komae City. 2011. *Katei ni okeru nyūyōji-ki no dokusho-kankyō ni kansuru chōsa-hōkoku* [Report on reading environment for children in households]. Retrieved from <http://www.city.komae.tokyo.jp/index.cfm/36,39670,c,html/39670/20110624-142513.pdf> on 29 Oct. 2012. (In Japanese)
- Kubozono, Haruo. 1989. The mora and syllable structure in Japanese: Evidence from speech errors. *Language and Speech* 32(3). 249–278.
- Leevers, Hilary J. and Paul L. Harris. 1999. Persisting effects of instruction on young children’s syllogistic reasoning with incongruent and abstract premises. *Thinking and Reasoning* 5(2). 145–173.
- Luria, Aleksandr Romanovich 1976. *Cognitive development: Its cultural and social foundations*. Cambridge, MA: Harvard University Press.
- McCawley, James D. 1978. What is a tone language? In Victoria A. Fromkin (ed.), *Tone: A linguistic survey*, 113–131. New York: Academic Press.
- Morais, Jose, Paul Bertelson, Luz Cary and Jesus Alegria. 1986. Literacy training and speech segmentation. *Cognition* 24(1–2), 45–64.
- Muto, Takashi, Megumi Misawa-Endo, Rie Sakata and Jinko Takeshige. 1992. Yōchienji no kana-moji no yomi to jibun no namae no yomi to no kanren [The relationships between nursery school children’s acquisition of Japanese syllabary and ability to read names]. *Hattatsu-shinrigaku-kenkyū* 3(1). 33–42.
- National Language Research Institute. 1972. *Yōji no yomikaki-nōryoku* [Reading and writing ability in pre-school children]. Tokyo: Tokyo Shoseki.
- Nishikawa, Yukiko. 1995. Yōji no monogatari sanshutsu ni okeru “katari” no yōshiki [The method of story-telling in the story production in children]. *Hattatsu-shinrigaku-kenkyū* 6(2). 124–133.
- Ōba, Makio. 1982. Yōji no seikatsu to moji to no deai: Ijikuriki no jūyōsei nitsuite [Children come across letters in their lives: The importance of the *ijikuri* period]. *Hoiku-kenkyū* 4(2). 48–61.
- OECD. 2012. Education at a glance 2012: OECD indicators. Retrieved from <http://dx.doi.org/10.1787/888932667026> on 8 Mar. 2013.
- Perfetti, Charles A. 1986. Cognitive and linguistic components of reading ability. In Barbara R. Foorman and Alexander W. Siegel (eds.), *Acquisition of reading skills: Cultural constraints and cognitive universals*, 11–40. Hillsdale, NJ: Laurence Erlbaum Associates.
- Richards, Cassandra A. and Jennifer A. Sanderson. 1999. The role of imagination in facilitating deductive reasoning in 2-, 3- and 4-year-olds. *Cognition* 72(2). B1–B9.
- Scribner, Sylvia and Michael Cole. 1981. *The psychology of literacy*. Cambridge, MA: Harvard University Press.
- Seidenberg, Mark S. and Michael K. Tanenhaus. 1979. Orthographic effects on rhyme monitoring. *Journal of Experimental Psychology: Human Learning and Memory* 5(6). 546–554.
- Shibasaki, Masayuki. 1987. Yōji wa hiragana o ika ni oboeru-ka [How do young children learn hiragana?]. *Bessatsu Hattatsu* (6). 187–199. Minerva Shobo.
- Shimamura, Naomi and Hiroko Mikami. 1994. Yōji no hiragana no shūtoku: Kokuritsu kokugo kenkyūjo no 1967 nen no chōsa to no hikaku o tōshite [Acquisition of hiragana letters by pre-school children: In comparison with the 1967 Investigation of the National Language Research Institute]. *Kyōiku-shinrigaku-kenkyū* 42(1). 70–76.
- Shimizu, Yuki and Nobuko Uchida. 2001. Kodomo wa kyōiku no disukōsu ni donoyōni tekiō suru-ka: shōgaku ichinen-sei no asa no kai ni okeru kyōshi to jidō no hatsuwa no ryōteki shitsuteki bunseki yori [How do children adapt to classroom discourse? Quantitative and qualitative analyses of first grade homeroom activities]. *Kyōiku-shinrigaku-kenkyū* 49(3). 314–325.

- Steinberg, Danny D. and Naoki Oka. 1978. Kanji to kana-moji no yomi no gakushū [Learning to read kanji is easier than learning individual kana]. *Shinrigaku-kenkyū* 49(1). 15–21.
- Steinberg, Danny D. and Jun Yamada. 1977. Dokuji gakusyū no genri to hōhō [Principles of moji learning and teaching]. *Shinrigaku-hyōron* 20(2). 61–81.
- Takahashi, Noboru. 1996. Shūgaku-zengo no kodomotachi no dokkai no nōryoku no kakutoku-katei ni tsuite: jūdanteki-kenkyū ni yoru bunseki [Acquisition of reading ability: A two-year longitudinal analysis in preschool and 1st grade year]. *Kyōiku-shinrigaku-kenkyū* 44(2). 166–175.
- Takahashi, Noboru. 1997. Yōji no kotoba asobi no hattatsu [A developmental study of wordplay in preschool children: The Japanese game “shiritori.”] *Hattatsu-shinrigaku-kenkyū* 8(1). 42–52.
- Takahashi, Noboru. 2001. Gakudō-ki ni okeru dokkai-nōryoku no hattatsu-katei: 1-5-nensei no jūdanteki na bunseki [Developmental change in reading ability: A longitudinal analysis of Japanese children from first to fifth grade]. *Kyōiku-shinrigaku-kenkyū* 49(1). 1–10.

II Second language (L2) acquisition/development and bilingualism/multilingualism

Yuko Goto Butler

3 Age factors in language acquisition

1 Introduction

Age has been considered one of the major factors explaining individual differences in language acquisition among bilinguals and multilinguals. The belief that “younger is better” appears to prevail widely among the general public, and it is often used as a rationale for introducing second/foreign language programs for younger children. Numerous studies have investigated the relationship between age and language acquisition/learning, but many questions remain unanswered. The present chapter focuses on age factors in second/foreign language acquisition. It includes the question of the critical period hypothesis (CPH), which may be defined as a prediction that there is a limited time period in one’s development during which native-like language attainment is possible. While the existence of some age-related effects in language acquisition is undisputable, the CPH has caused heated debate among scholars in academic disciplines ranging from linguistics and psychology to neuroscience. This chapter discusses the conceptual and methodological issues and challenges that have arisen in previous studies on the effects of age in second/foreign language acquisition.

Unfortunately, very few published empirical studies have examined the CPH in the context of Japanese language acquisition. Hasegawa (2008) suggested that the scarcity of research on this topic among Japanese language learners could be largely due to the fact that Japan has not historically had a large number of immigrants (i.e., Japanese as L2 learners). No matter what the reason, it is at least evident that we have not paid sufficient attention to this group of Japanese learners until relatively recently.

As a language that is typologically very different from European languages, Japanese can make a unique contribution to the literature by enhancing our understanding of the complex nature of age effects in L2 acquisition. Until such research surfaces, however, we are left to depend largely on studies that investigate age effects on the acquisition of languages other than Japanese. And so, with the exception of a few Japanese studies, I draw primarily on research on this topic that has been conducted predominantly in European language learning contexts. I conclude the chapter with suggestions for future research.

2 The original notion of a critical period: A neurobiological claim

It is generally agreed that there are some age-related effects on second language (L2) acquisition as well as on first language (L1) acquisition. However, discussions of the CPH in language acquisition are highly complex. Scholars reach different conclusions depending on their theoretical positions and methodological approaches. Major disagreements can be found with respect to: (1) whether a critical period exists in L2 acquisition; (2) if it does, when the critical period begins and ends; (3) the knowledge domains affected by the critical period; and (4) the reasons behind the differences in ultimate attainment of L2 by age (Butler 2013; de Groot 2011; Singleton 2005). One source of such disagreements comes in conceptualizing the critical period itself. There is no consensus as to what the critical period means and what evidence should be presented to prove or disprove the CPH.

The notion of a critical period originates from studies of animals' instinctive behaviors. It refers to a designated developmental phase in which certain capabilities and behaviors of an organism have to be learned in order for them to become functional in the organism. Imprinting behaviors among geese and singing among some songbirds are frequently cited as examples of learning that takes place during a certain critical period. Importantly, in the study of animal behavior, critical periods are associated with an innate biological mechanism that is programmed as part of newborns' survival; the behaviors/capabilities in question are no longer attainable once the designated critical period has passed (Singleton and Ryan 2004).

When the notion of a critical period was first extended to human language acquisition, neurologists made claims based on their clinical observations. Penfield and Roberts (1959: 237) suggested the existence of "a biological clock" in the brain for language learning that shuts down around the age of nine. Similarly, Lenneberg (1967), based on his clinical observations of aphasia patients, children with Down syndrome, and deaf children, formulated the critical period hypothesis (CPH), claiming that the window opens around at the age of two and closes with puberty, which, in his view, coincides with a loss of brain plasticity resulting from the completion of hemisphere lateralization. These earlier "neurological" explanations to support the critical period in language acquisition are not supported by more recent behavioral and neurological research. However, the notion of a critical period in language acquisition has inspired many researchers, and a substantial amount of research has been conducted.

3 Empirical data on the CPH in L1 acquisition

In L1 acquisition, case studies of children who were deprived of natural linguistic input are often used as evidence to support the CPH. After reviewing well-known

cases of deprived children such as Chelsea, Isabelle, and Genie, one might hypothesize that a possible limit for native-like attainment in L1 is somewhere between the age of seven and puberty (Hyltenstam and Abrahamsson 2003). Fujinaga (1997) reported two cases from Japan (one was discovered at the age of five and the other at the age of six), and showed that the both of the children had trouble acquiring native-like syntax. This result suggests that the critical period may end even before the age of five.

Though the data from these deprived children certainly tells us something about age and L1 attainment, it is not clear that their failure to attain native-like proficiency in L1 was due strictly to their missing the critical period for language acquisition. Cognitive developmental delays as well as various affective problems associated with deprivation and abuse (as in the case of Genie, who was strapped to a chair naked in a small room most of the time until the age of 13 and a half) were also reported in those children's cases, and these factors might also be responsible for their difficulty with L1 attainment, to at least some degree. Interestingly, recent neurological research indicates that there may be critical periods for social isolation and neglect. Deprivation before the age of four results in smaller brain sizes and creates difficulties in developing normal social behaviors. Children cannot fully recover from such impairments after the age of four, even if the deprivation ends (Perry 2002). All these factors, including the age of onset of L1 learning, appear to be interrelated and influence L1 development in a complex manner among deprived children.

Another type of evidence to support the CPH in L1 acquisition comes from deaf children who started being exposed to sign language at different ages. In Newport (1990), the morphosyntactic acquisition in American Sign Language (ASL) was poorer as the age of first exposure to the target language (age of onset, AO) increased. It is important to note, however, that differences in overall performance were already found between native-signers (i.e., those who have been exposed to sign language from birth) and signers whose AO was four to six, suggesting that the critical window may close before the age of four. It is also curious to note that the effects of AO may be different depending on the types of syntactic knowledge; it seems that some morphosyntactic knowledge was more affected by age. Similarly, Emmorey, Bellugi, Friederici, and Horn (1995) found different performance by signers with different AO in the domain of verb-agreement but not in aspect marking. Since aspect is more related to meaning than to morphosyntax per se, the researchers hypothesized that the AO may influence syntactical processing but not semantic processing.

4 Different conceptualization of the CPH in L2 acquisition

When it comes to the CPH in L2 acquisition, studies have yielded inconsistent results. Some of the complexity surrounding the CPH debate comes from the fact that in

addition to *critical periods*, various related terms have been used in the literature, including *sensitive periods*, *maturational constraints*, *age effects* and so forth. Moreover, there is some inconsistency in what each of these terms refers to.

Researchers differ with respect to how to conceptualize the CPH in the first place. Conceptualizations include: (1) whether a linear decline in attainment can be taken as an evidence for a critical period; (2) the nature and the degree of reversibility/plasticity after missing a critical period; and (3) the nature of the relationship between L1 and L2 acquisition with respect to age. The conceptual differences also influence the way research is conducted (i.e., methodology) and the kinds of evidence used to support the CPH.

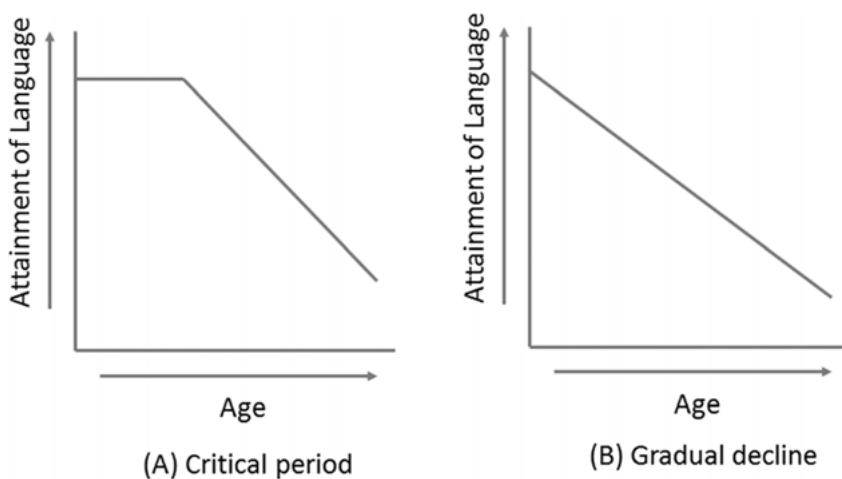


Figure 1: Two types of evidence presented for the CPH (Butler 2000: 160)

The first conceptual disagreement is related to the nature of the decline. Hakuta (2001: 195-196) proposed that the following characteristics have to be presented as evidence for a critical period: “(1) there should be clearly specified beginning and end points for the period; (2) there should be a well-defined decline in L2 acquisition at the end of the period; (3) there should be evidence of qualitative differences in learning between acquisition within and outside of the critical period; and (4) there should be a robustness to environmental variation inside the critical period.” According to Hakuta, therefore, a linear decline in performance by age (B in Figure 1) is not sufficient as evidence for the existence of a critical period; rather, it simply indicates a *maturational effect* (or *age effect*). A number of other researchers (e.g., Bialystok and Hakuta 1994; Birdsong 2005; Bongaerts 2005; Butler 2000; Flege 1999) take the same position. Others (e.g., DeKeyser and Larson-Hall 2005; Newport, Bavelier, and Neville 2001), however, use a linear decline as evidence for a critical period.

Second, views differ with respect to the nature and the degree of reversibility/plasticity after missing a critical period. Once a designated time period is passed, can one no longer attain native-like proficiency in a given language? Alternatively, the possibility may still remain after the critical period, but it may gradually fade away as a result of interplay with other experiential factors. The latter position, a weaker version of the CPH, is sometimes referred to as *sensitive periods*, but the term is not necessarily used consistently. The issue of reversibility/plasticity also relates to the point about the exact nature of any constraints. Is it a matter of *probability* of obtaining native-like proficiency or is it a matter of *potentiality* of obtaining native-like proficiency? If probability is what matters, random sampling (under the assumption that optimal exposure was provided) should be critical. But if potentiality is what matters, a screening of participants would be acceptable, and, in fact, it might be sufficient to argue against the CPH by presenting one exceptional individual who attained native-like proficiency in his/her L2 after passing the critical period (Long 1990).

Third, but not least, the CPH can be interpreted differently depending how the nature of the relationship between L1 and L2 is conceptualized. Johnson and Newport (1989) offered two possible interpretations of CPH: the *exercise version* and the *maturational state version*. The exercise version considers that as long as one can be exposed to an L1 during the critical period, the capacity to attain native-like proficiency in L2 remains intact. This interpretation therefore opens a door for late L2 learners to be able to attain the native-like proficiency in their L2. The maturational state version, the more popular of the two views, says that a learner has to be exposed to a language during the critical period to attain native-like proficiency in the given language. Logically speaking, this means that later starters of L2 learning after the critical period will not be able to attain native-like proficiency in their L2. In practice, however, it is usually assumed that most late learners of L2 have a normal exposure to their L1 and that they have developed a basic neurological system to acquire a language. The issue can be translated as a matter of whether (or to what extent) neurocognitive systems of first and second language acquisition are qualitatively different. If there are qualitative differences between L1 and L2, the question is how such differences may disappear (or not disappear) as a result of the interaction between age and various internal (e.g., gender, aptitudes, motivation, etc.) and external factors (e.g., instructional types, the amount and quality of input, etc.). A number of models have been proposed based on different predictions of the neurological and cognitive systems of L1 and L2. For example, the declarative/procedural model predicts distinct systems for L1 and L2 (Ullman, 2004), whereas the competition model is based on a prediction that there is a single system for L1 and L2 (MacWhinney 2005).

In sum, the CPH itself has multiple definitions and interpretations. Depending on how the CPH is understood, different research methodologies have been employed and varying evidence has been presented for or against the CPH.

5 Varying times and domains affected by the critical period

Even among researchers who support the CPH, different offset times have been proposed, ranging from shortly after birth (Abrahamsson and Hyltenstam 2009) to 12–15 years old, or puberty (Lenneberg 1967; Patkowski 1980; Scovel 2000).

Scholars also disagree about the linguistic domains affected by critical periods. Scovel (1988, 2000) suggests that the CPH discussion should be applied only in the domain of phonology/phonetics because pronunciation, in his view, is the only area of language that “demands neuromuscular programming” (1988: 62). Others propose multiple critical periods in different domains (e.g., *multiple critical period hypothesis*, Seliger 1978). For example, Long (2005) proposes that the offsets are somewhere around 6 years old to the mid-teens depending on the domain: 6–12 years old in phonology; 15 years old in morphosyntax, and 6 to the mid-teen years in lexicon. It is unclear, however, why there might be different age effects in different domains. Also unclear is the nature of the interrelationship of constraints in different domains. For example, do phonetic and morphosyntactic intuitions develop simultaneously depending on the learners’ AO? In a recent study conducted by Abrahamsson (2012), a significant correlation between Voice Onset Time (VOT, a measure of phonetic intuition) and a grammaticality judgment test (GJT, a measure of morphosyntactic intuition) was found only among early starters whose age of onset (AO) was 1–15 years old, but not among the later starters (the AO 16–30 group) and the native speakers. However, given the fact that learners’ performance in both VOT and GJT were significantly correlated with AO, the correlation between VOT and GJT among the AO 1–15 group became non-significant if the effect of AO was removed. Abrahamsson suggests that “different parts of the L2 develop with different rates and even by different means in early and late learners” (Abrahamsson 2012: 208).

5.1 Phonological/phonetic domain

In phonology, there is almost no dispute regarding the existence of some sort of age effects. However, the precise relationship between AO and phonology attainment is more complicated than it first appears.

First, the degree and/or pattern of age effects appear to be different depending on the types of tasks introduced within the phonological domain. Learners’ performance in L2 pronunciation generally shows a gradual decline as AO increases, instead of showing a clear discontinuity. The decline also tends to start even among learners with very early AOs (e.g., Flege, Munro and MacKay 1995; Flege, Yeni-Komshian and Liu 1999; Granena and Long 2012; Oyama 1976). Abrahamsson (2012),

however, showed a nonlinear pattern in learners' performance in VOT; there seems to be a qualitative difference between early starters and late starters. Though a significant correlation between AO and VOT was found among learners with an AO less than 15, AO was not significantly correlated with VOT among later learners (AO 16–30). Previous studies also indicate that more L2 learners were rated as a native-level when performing isolated, controlled tasks such as reading aloud a list of words than when they performed more open-ended, spontaneous tasks. Whereas isolated, controlled tasks may help the learner focus on phonetic precision, open-ended, spontaneous tasks involve real-time processing and other linguistic knowledge (e.g., knowledge in syntax, vocabulary) in a more complicated fashion (Moyer 1999, 2007). Different age effects were found not only in segmental features (e.g., vowels and consonants) but also in different supersegmental features (e.g., pitch and stress) (Huang and Jun 2011).

Second, while AO certainly plays a significant role in L2 phonology attainment, it is not clear to what extent AO is responsible for native-like phonological acquisition because there are a number of confounding variables such as L2 input, the degree of L1 use, and motivation to attain native-like accents (DeKeyser 2012; Flege 2009; Moyer 2007). For example, one can imagine that compared to later learners, earlier starters tend to receive more education in their L2 and to be immersed more heavily in the L2 community, and they may have stronger motivation to sound like a native speaker. As I discuss further below, all these factors are presumably confounded with age, and the relationships among them are not yet clear.

Moreover, some individuals who started learning L2 after puberty have been judged to show a native-level performance (e.g., Birdsong 2007; Ioup et al. 1994; Piske, MacKay, and Flege 2001). These exceptional individuals have at least two common features; they all had substantial exposure to the target language and/or extensive high-quality instruction in L2; and they all had a high degree of motivation to acquire native-like pronunciation. It is still debatable, however, whether these individuals indeed had native-level of proficiency. Some researchers argue that these successful learners may have *native-like* proficiency but not exactly the same level of proficiency that native speakers have (e.g., Hyltenstam and Abrahamsson, 2000).

5.2 Morphosyntactic domain

In morphosyntax, the picture is even more complicated, and the question of a critical period in morphosyntax is highly controversial. As in phonology, we can find a number of correlational studies and studies that compare grammatical intuition (often measured by a grammaticality judgment task, GJT) among learners with different AO as well as a native-speaking control. For example, in a well-known study by Johnson and Newport (1989) conducted among Korean and Chinese learners of

English, there was a strong negative correlation ($r(21) = -.87$) between AO and performance in a GJT among early learners (those who were exposed to L2 before puberty, defined as 16 years old); however, no significant correlation was found among late learners (AO 17–39). Johnson and Newport took these findings as supporting evidence for a critical period, which was defined as “puberty.” However, it is also important to note that their cross-sectional comparison indicated that the mean performance in the GJT among the earliest AO group (AO 3–7) was indistinguishable from that of native speakers, but performance among later AO groups showed a gradual decline. Thus something may occur related to AO before and after age seven.

Previous studies have generally found negative correlations between the learners’ AO and morphosyntax performance. However, the data are inconsistent with respect to the degree of association between the two variables (i.e., AO and morphosyntax performance) and whether there is a discontinuity in the association (i.e., correlations differ before and after a certain AO). For example, Abrahamsson (2012) and Dekeyser (2000) found correlational patterns in early and late starters similar to those found by Johnson and Newport (1989). On the other hand, Birdsong and Molis (2001), replicating Johnson and Newport (1989) with Spanish-speaking learners of English using the same GJT items, found a negative correlation ($r(29) = -.69$) among late starters (AO 17 and after) but not among early starters: an opposite pattern from that of Johnson and Newport. As Birdsong and Molis (2001) acknowledged, however, their failure to find a significant correlation among the early starters could be due to a ceiling effect (i.e., little variation among the early starters). Flege et al. (1999) reported a significant negative correlation ($r(118) = -.52$) among early starters (AO less than 12) and a smaller but still significant negative correlation ($r(118) = -.27$) among later starters (AO greater than 12). As one can see, the cut-off points for AO differed among these researchers as well. To make matters more complicated, depending on the statistical methods employed, researchers have even obtained different results from the same data set. Bialystok and Hakuta (1994) reanalyzed Johnson and Newport’s (1989) data and showed that if a nonlinear statistical method was employed, the cut-off point would be 20 as opposed to 16, a pre-determined cut-off point used in the original study. Twenty-year-olds may be too old to be described as at “puberty.”

Moreover, as in phonology, cases of exceptionally successful late starters have been reported (e.g., Birdsong 1992; Bongaerts 1999; Bongaerts, Mennen, and van der Slik 2000; Ioup, Boustagui, Tigi, and Moselle 1994; White and Gennese 1996). Birdsong (1999) speculates that somewhere around 5%–25% of late starters may reach native-like proficiency. If Birdsong’s speculation is correct, then these people may not be “exceptional” after all. However, as in phonology, some researchers question whether these individuals indeed obtain a native level of proficiency. Based on his finding that very few later learners were judged as “native” in the GJT and VOT tasks that he employed, Abrahamsson (2012: 209) argues that a native level

of attainment in both the phonology and morphosyntax domains is “highly unlikely (or even impossible) if first L2 exposure occurs after puberty (AO > 13).”¹ Similarly, Abrahamsson and Hyltenstam (2009) reported that a group of very successful learners who passed the nativelike-level still fell short of native speakers in some of the most cognitively demanding linguistic tasks. Marinova-Todd, Marshall, and Snow (2001) argue, however, that such subtle differences would be within the range of native speakers’ variation. Nishikawa (2014), in one of very few studies conducted among Japanese L2 learners in Japan, found that native-like performance in cognitively demanding comprehension and production tasks using Japanese relative clauses was not obtained even among early starters (AO < 4). However, as the author indicated, there was some confusion about the tasks themselves among younger participants; the age of testing rather than AO turned to be more influential over their performance. At this point, there is no consensus as to what counts as native speakers’ linguistic abilities and what kinds of measures would be sufficient to capture such abilities.

5.3 Lexical domain

Beyond phonology and morphology, there has been very limited research, although a small number of studies have examined the lexical domain (e.g., Abrahamsson and Hyltenstam 2009; Granena and Long 2012). Among them, Li (2006) may be of particular interest to many readers of this chapter, because, along with Nishikawa (2014) just mentioned above, it is one of very few studies looking at age effects in the context of Japanese L2 language acquisition. Li’s study is worth describing in detail in that it is also one of the very few studies that examined learners’ performance in both their L1 and L2.

Li’s (2006) participants were 15-year-old Chinese-speaking students who were enrolled in a Chinese-Japanese immersion program in Japan. Based on their AO, they were classified into three groups: early arrivals before formal schooling (AO less than seven); mid-arrivals (AO from 7 to 10); and late arrivals after the critical period (defined as 11). It was found that, in their L2 (Japanese), the early arrivals’ performance on a vocabulary test was significantly higher than the performance of the two later arrival groups. Conversely, in their L1 (Chinese), the late arrivals performed significantly better than the early and mid-arrival groups. It turned out that the three groups had different vocabulary profiles. While the early arrivals had stronger vocabulary performance in their L2 than in their L1, the late arrivals had

¹ Abrahamsson (2012) did not report the percentage of learners who reached the “native” level in GJT and VOT separately. It is worth noting, however, that approximately a half of the participants whose AO is higher than 16 (45 out of 95) scored the “native” level either in GJT or VOT.

stronger performance in their L1. There was no significant difference between L1 and L2 among the mid-arrivals. Note, however, that both L1 and L2 performance among the late arrivals still reached the grade equivalent level. Among the earlier arrival groups, L2 performance either exceeded grade level (in the case of the early arrivals) or reached grade level (the mid-arrivals), but their performance in L1 fell short of the grade equivalent level. A longitudinal portion of Li's (2006) data (following the students until the 12th grade) also indicated steady increases in performance in both L1 and L2 only among the late arrivals. The early and mid-arrival groups showed steady increases in L2, but not in L1. While the students' length of residence (LOR) in Japan was not controlled in Li's analyses, the study makes a unique contribution within a context different from the majority of studies on this topic.

A similar finding was reported by Kataoka, Koshiyama, and Shibata (2008), who examined the development of English (L2) and Japanese (L1) vocabulary (as well as select syntactical knowledge in Japanese) among Japanese students with different AOs in the U.S. While early arrivals (AO < 8) exhibited higher vocabulary performance in English vocabulary than in Japanese vocabulary after staying in the U.S. for three years, later arrivals (AO from 9 to 11) developed grade-equivalent levels of vocabulary knowledge both in English and Japanese after three years of residence in the U.S.

In the lexical domain, however, a completely different picture may emerge depending on types of vocabulary knowledge being tested. Li (2006) and Kataoka et al. (2008) tested vocabulary in a school context. Abrahamsson and Hyltenstam (2009) tested knowledge of idioms and proverbs as one of their measurements, and found that even among their highly successful learners with early AOs (AO < 11), only 58% showed native-level of performance in idioms and only 17% did so in proverbs. Among the later arrivals (AO > 13), the portions dropped to 20% in idioms and 10% in proverbs. The success that Li (2006) found among late arrivals (AO 11–14) may also be due in part to similarities in vocabulary (especially academic-related vocabulary) between Japanese and Chinese.² As Abrahamsson and Hyltenstam (2009)'s data shows, one can expect substantial variability in vocabulary knowledge among "native-speakers" as well. In any event, age effects in lexicon acquisition remain largely unknown because of the very limited number of empirical studies that have been done so far.

In sum, the debate on CHP is far from conclusive. Researchers disagree with respect to domains that are constrained by age, whether one can identify a critical period, and when the onset and offset of the critical period occur.

² This interpretation is plausible considering that the latest arrivals (AO > 11) in Kataoka et al. (2008) showed difficulties in reaching the grade equivalent level in their English vocabulary (although longitudinal data was not available among this group.)

6 Neurocognitive explanations for age effects: Not yet clear

As we have seen, the CHP was originally a neurobiological claim. Instead of a loss of brain plasticity, psychologists and neuroscientists have offered a number of other neurocognitive explanations for age effects in different domains.

One approach is to explain ultimate L2 attainment in relation to L1 maintenance. The *speech learning model* in phonology proposed by Flege and his colleagues (e.g., Flege 1999) is an example of this approach. This model assumes that both L1 and L2 phonetic/phonemic elements share a common phonetic space and predicts that L1 and L2 influence bi-directionally during production among bilinguals. When an L2 sound is similar to an existing L1 sound, the new L2 sound is perceived to be an extension of the existing L1 category and the two sounds are merged into a single phonemic category. This process is called *phonetic category assimilation*. When an L2 sound is perceived as dissimilar from the closest L1 sound, a new L2 category will be formed. However, to maximize the distinction between the new L2 sound and its closest L1 sound, the two categories may become more distinctive than they should be. This process is called *phonetic category dissimilation*. Importantly, these processes are hypothesized to happen more frequently among late L2 learners because late learners tend to develop stronger L1 categories in their memory. This is because of their larger amount of exposure to the L1 sounds compared with those who are exposed to L2 early in their lives, not because late learners lose the ability to acquire L2 sounds. The speech learning model therefore suggests the importance of massive L2 input and extensive L2 training in the ultimate attainment of L2 phonology.

Similarly, MacWhinney's competition model (MacWhinney 2005) and Pallier's interference hypothesis (e.g., Pallier et al. 2003), although they do not restrict their scope to the phonology domain, also attempt to explain L2 acquisition in relation to L1 maintenance. Namely, L2 acquisition would be increasingly difficult over time due to growing entrenchment of L1. We need more empirical data to see whether these hypotheses hold true. In morphosyntax, a recent study by Bylund et al. (2012) reported that L2 learners who exhibit native-like proficiency also showed a native level of L1 and claimed that nativeness in L2 does not necessarily hamper nativeness in L1.

Recent advances in neurological technology, such as Event-related Potentials (ERPs), have made a unique contribution to the debate on the CPH. ERPs make it possible to capture real-time electrophysiological patterns in cognitive processing in milliseconds. It has been found that distinct patterns of ERPs (i.e., waveforms that have either positive or negative polarity with certain latency) are elicited for syntactic and semantic processing. For L1 speakers, syntactic processing elicits an early (in a range of 150ms to 500ms) left anterior negativity (LAN) as well as late centroparietal positives that reach their peak somewhere around 600ms after

stimulus (P600). For semantic processing, centroparietal negatives at around 400ms (N400) are typically elicited (Kaan 2007).

Earlier ERP studies tend to provide some supporting evidence for the CHP. For example, Weber-Fox and Neville (1996) found that, in syntactic processing, only early learners (AO < 11) showed LAN and P600 effects that were similar or identical to those of native speakers, but in semantic processing, all their Chinese/English bilinguals showed an N400 elicitation regardless of their AO. Similarly, in Weber-Fox and Neville (2001), brain activation patterns differed between early learners (AO < 7) and native speakers when processing closed-class words (requiring syntactic processing) but not when processing open-class words (requiring more semantic-based processing). Asymmetric AO effects in syntactic and semantic processing have also been reported by other researchers, including Hahne (2001) and Hahne and Friederici (2001). Based on these results, it has been suggested that learning of syntactic function is different from semantic learning, and only the former seems to be constrained by age (Ullman 2004).

More recently, however, a growing number of researchers have paid attention to the learners' proficiency, a confounding factor of the AO, and have claimed that learners' proficiency level rather than AO is more important in determining brain activation patterns. Namely, different brain activation patterns observed in the above-mentioned studies are largely due to the fact that late L2 learners had lower proficiency in L2. Steinhauer et al. (2006), for example, examined late learners of English (AO > 12) with two different proficiency levels (high and low groups). They also had two typologically distinct L1 languages: French and Chinese. When the learners engaged in syntactic processing, the high proficiency group, regardless of their L1 background, exhibited the same brain activation pattern as did native speakers (a LAN followed by a P600), while the low proficiency group showed only a P600. Since the LAN effect is considered to be associated with automatic syntactic processing,³ the authors suggest that the low proficiency learners may not yet to be able to detect syntactic violation automatically as native-speakers do, whereas high proficiency learners, even if their AO was rather late, can still show native-like brain activation.

Whether L1 and L2 operate in a single processing system or separate systems is still controversial. However, current ERP studies suggest that late L2 learners *can* display native-like brain activation patterns when engaging in morphosyntactic processing with increasing proficiency and exposure to L2. Interestingly, types of instruction (i.e., implicit vs. explicit) seem to play some role as well; those who learn L2 in an implicit fashion can display more native-like brain activation. AO does not seem to matter when it comes to semantic processing. As Morgan-Short and Ullman

³ However, the assumption that a LAN is responsible for automatic implicit processing is still debatable (Kaan 2007; Steinhauer et al. 2009).

(2012: 293) described, these findings may be “promising for adult L2 learners”. However, as they also cautioned, we must remember that “native-like neurocognition does not imply native-like proficiency” (Morgan-Short and Ullman 2012: 293). It is still premature to jump to a conclusion about the CPH until we can narrow the gap in knowledge between neurocognitive processing and actual linguistic behaviors.

7 Problems with the previous research

There are a number of methodological challenges and problems in conducting research on the CPH.

7.1 Problems with variable control

First is the inherent linear dependency among three influential variables: the age of onset (AO), the length of residence in the target language community (LOR), and the chronological age of testing (AOT) (Bialystok and Hakuta 1994; Stevens 2006). Previous studies frequently used a research design that compared linguistic performance among learners with varying AO. In principle, the other two influential variables (LOR and AOT) should be kept constant in order to see the effect of AO over one’s performance. However, there is an inherent tension among the three variables. That is:

$$\text{AOT} = \text{AO} + \text{LOR}$$

If learners are given the same length of exposure to the target language, the age of testing differs accordingly. If learners are tested at the same age, the length of exposure varies. The problem is that, while all three variables potentially influence learners’ L2 attainment, we cannot keep both AOT and LOR constant simultaneously.

Until recently, LOR, which is treated as a gross measure of the amount of L2 input, has been considered relatively unimportant (DeKeyser and Larson-Hall 2005). This is in part due to the fact that some earlier studies such as Johnson and Newport (1989) did not find LOR to be significant with regard to L2 learners’ performance. More recently, Larson-Hall (2006) examined Japanese learners’ word-initial /ɪ/ and /l/ production in English and reported that a short LOR contributed some improvement in their performance but longer LORs did not. Previous studies incorporating LOR often assume that learners will reach a plateau in five to ten years uniformly across different age cohorts.

However, we also have evidence showing a relation between learners’ LOR and their L2 performance, and the relationship may last longer than 5-10 years after the learners arrive in the target language community (Stevens 2006). For example, as

with Larson-Hall (2005), Saito and Brajot (2013) examined Japanese learners' word-initial /ɹ/ production in English, but conducted detailed acoustic analyses while employing different task conditions. They found that LOR had significant effects in the primary acoustic cue (the third formant, F3) in a spontaneous task condition and that "[t]he non-native, primary cue did not show a clear leveling-off effect... , even for individuals with greater than five years LOR" (13).

Moreover, different age cohorts tend to receive different types of exposure to the target language even within the same length of time (i.e., *age-cohort effects*). Many of our life experiences, such as schooling, employment, and marriage, are age-related, and people in the same age cohort tend to be similarly affected by these life experiences, which in turn influence their L2 exposure, motivation to acquire L2, and ultimate L2 attainment. Put differently, learners in different age cohorts tend to have different types of linguistic and motivational experiences in the target language community during the "same" time span.

Indeed, a number of studies indicate that not only the *quantity* of input but also the *quality* of input plays an important role in one's ultimate attainment of L2. In phonology, L2 learners' degree of accent have been found to differ depending on the quality of input, such as the amount of L2 input received from native speakers vs. accented input from non-native speakers, as well as the amount of L1 use. For example, Flege and Liu (2001) reported that LOR turned out to be a significant factor among students who had substantial exposure to native speakers' input, but not among non-students who had less exposure to input from native speakers. Flege, Frieda, and Nozawa (1997) showed an effect of amount of L1 (Italian) on the participants' L2 (English) even among early starters (the average AO was 5.7). Based on self-reports, those who used L1 more than 30% of the time were judged to have stronger L2 accents than did those who used L1 less than 3% of the time. It seems that the quality of input as well as the amount of input needs to be considered carefully in the study design. As mentioned before, earlier studies did not find LOR significant for L2 learners' performance. One can argue that this is not because input is unimportant, but because LOR itself is "an unreliable predictor" (Moyer 2009: 162) that does not capture the quality of input accurately and sufficiently. Researchers, however, have not yet come up with a good method to capture the quality of input (Flege 2009; Moyer 2009). A combination of qualitative and quantitative approaches appears to be indispensable.

In previous studies, age of testing (AOT) has received the least consideration among the three variables; however, we should not underestimate the potential impact of AOT on study results. A substantial amount of research shows developmental changes in information processing speed, working memory, and other cognitive abilities. Such age-related cognitive changes in turn influence one's L1 and L2 acquisition at any given developmental stage and one's performance at the time of testing (Birdsong 2006; Singleton and Muñoz 2011). Different cognitive abilities among L2 learners at the time of testing may influence their performance

differently depending on the linguistic domains being investigated and the tasks used to measure L2 proficiency. Researchers need to pay more careful attention to possible interaction effects between learners' AOT and kinds of cognitive abilities required to achieve the linguistic tasks used in their studies.

7.2 Problems with measurements

The second methodological problem in previous studies is measurement. Various types of instruments and tasks have been employed, but information on the validity and reliability of these instruments is often missing in the study reports. If the instrument ends up having a ceiling effect, it may fail to capture differences that exist between native speakers and L2 learners as well as among L2 learners with different AOs. Grammaticality judgment tests are frequently used in studies on morphosyntax acquisition as a measurement of “grammatical intuition” (Bylund, et al. 2012: 224), but they may not necessarily capture L2 learners' implicit knowledge regardless of their AO. Judgments by native speakers, such as determining the degree of foreign accent, are frequently used in language production data analyses, but the possibility of biases in their judgments due to their backgrounds has been raised as an issue (e.g., Long 2005). Moyer (2007) expresses her concern with respect to elicitation techniques used in production tasks. Direct imitation or simple repetition tasks are frequently employed, but “imitation as a means to discover whether a learner can ‘sound native,’ only for a few seconds at a time, hardly provides insights into phonetic/phonemic accuracy under real-time processing conditions” (Moyer 2007: 113). Though Moyer (2007: 113) recommends using spontaneous speech as “the most appropriate way to probe true ultimate attainment,” she also admits that it is more complicated to analyze such data because, as we have mentioned already, authentic tasks involve multifaceted linguistic knowledge of morphosyntax, semantics, lexicon, and pragmatics as well as phonology.

The problem with the instruments comes down to the fact that there is no consensus as to what counts as native-speakers' linguistic abilities and how best to capture such abilities. Depending on the researchers' theoretical foundations (e.g., formal linguistics, psycholinguistics, social-contextual traditions, and so forth), the competencies that constitute proficiency are considered differently. Accordingly, domains of investigation and tasks employed to capture competencies will be different among researchers of different backgrounds.

7.3 Problems with conceptualizing bi-/multilinguals' proficiency

The third methodological concern is whether it is valid to locate monolingual native speakers and L2 learners (namely, bilinguals and multilinguals) on the same spectrum. It is a common practice to determine bilinguals' proficiencies in relation to

monolingual native speakers' proficiencies using the same instruments. However, the validity of this practice is questionable if monolinguals' and bilinguals' proficiencies are qualitatively different. A number of bilingual researchers argue that bilinguals are not a juxtaposition of two monolinguals (e.g., Cook 1992; Grosjean 1998; Herdina and Jessner 2000). Thus, it is inappropriate in the first place to apply monolingual norms to bilinguals and to compare bilinguals' performance in L1 and L2 to that of monolinguals of either language. The monolingual view of the bilinguals, namely, the view that bilinguals are two monolinguals coexisting in one individual, is criticized as *monolingual bias* (De Angelis 2007). If bilinguals' proficiencies are qualitatively different, subtle "differences" found in previous studies (e.g., Abrahamsson and Hyltenstam 2009; Coppieters 1987; Ioup, Boustagui, Tigi, and Moselle 1994; Moyer 1999) between successful L2 learners and native speakers would not be too surprising. They may simply indicate the different nature of proficiencies between monolinguals and bilinguals. Singleton (2003) suggests that bilinguals' performance should be compared with that of other bilinguals with different AOs, but not with that of monolingual "native speakers."

7.4 Problems with the selection of participants

The fourth, but not the least, potential methodological problem is the selection of "L2 learners" and "native speakers." In practice, the learners' age of arrival to the target language community (AOA) is often operationalized as an indicator of age of onset (AO). However, AOA is not necessarily the same as AO, depending on the individual. As we have discussed already, because variables such as type of L2 exposure, the role of instruction (both implicit and explicit), and the use of L1 both prior to and after arrival in the target language community may have significant impacts on L2 learners' performance, more careful consideration of these variables seems to be necessary when comparing the learners' performance according to their AOA. Singleton and Muñoz (2011: 413) suggest that researchers should use the "age of onset of *significant* exposure" as opposed to AOA when examining the age effect. The age of onset of significant exposure can be the time when L2 learners begin to receive intensive instruction by native speakers prior to arrival in the target community, or it can be the time when substantial daily interaction with native speakers begins a couple of years after immigration (e.g., when entering school). Though this suggestion is certainly appealing, how to determine "significant exposure" may not always be straightforward.

Some researchers also address their concern about potential *bilingual bias* in selecting L2 learners for studies (De Angelis 2007). The bilingual bias is an assumption that psycholinguistic representation and processing are fundamentally the same in bilinguals and multilinguals, but may be more complicated and contain more noise in multilinguals. This view is reflected in studies where "L2 learners" were chosen without carefully examining the learners' possibility of having an additional

language or languages and controlling for the potential effects from the additional languages over their L1 and L2 learning. The same potential problem is applied to the selection of “native speakers”; they may have an additional language or languages but may still be treated as monolingual speakers. We should take these criticisms more seriously, because there is growing evidence that a minimum exposure to an additional language or languages can influence one’s psycholinguistic representation and processing in L1 and L2 as well as social-affective profiles, which in turn also may influence performance in L1 and L2 (De Angelis 2007).

8 Other age-related factors

It should be apparent to the reader by now that an increasing number of voices are calling on researchers to pay more attention to a variety of age-related factors in discussion of the CPH, rather than simply focusing on neurological/ biological factors. Flege (2009: 184) suggests that AO is not a simple quantifiable measure but that it should be considered as a *macrovariable* that is composed of multiple age-related variables including: “(1) state of neurological development when L2 learning begins; (2) state of cognitive development when L2 learning begins; (3) state of development of L1 phonetic category representations when L2 learning begins; (4) L1 proficiency; (5) language dominance; (6) frequency of L2 (or L1) use; and (7) kind of L2 input”. Similarly, Moyer (2009) has articulated the complex nature of the cognitive, social-affective, and environmental factors underlying LOR. As we have seen above, AOT should also be considered a composite of multiple variables that interact with tasks and task performance among learners.

8.1 Cognitive factors

Cognitive developmental literature has shown that our speed of information processing increases non-linearly (exponentially); it initially shows a rapid increase until the mid-teens and then a slower and gradual decline during adulthood (Fry and Hale 2000). Working memory ability has a similar non-linear pattern. One’s memory span increases relatively rapidly during early childhood (somewhere around 6–10 years old) and shows a slower increase until it reaches the adult level around the mid-teens. On average, the memory span of preschool children is only one-third that of young adults. And there may be not only quantitative but also qualitative changes in working memory at around 6 years old when children start entering primary school; younger children may use different mnemonic strategies than older children. It is important to note, however, that there are substantial individual differences in working memory across age levels (Dempster 1981). Analogical abilities used to be considered a late development; however, it has been discovered that children as young as three years old appear to be able to demonstrate basic analogical reasoning. Self-regulation and metacognition begin to develop at around five to seven

years old. However, the precise interrelationships among these cognitive abilities in relation to age are not yet clear (Fry and Hale 2000). Recently, in their investigation of morphosyntax attainment among relatively early learners (AO < 12), Bylund et al. (2012) found that learners' high aptitude, but not age of onset or amount of L1 use, significantly predicted their ultimate attainment in L2. Certainly, there is a close relationship between cognition and language development, although "there may not be a simple cause and effect relationship" but "an intertwining and interdependence of the two during development" (Singleton and Ryan 2004: 155). This complicated mechanism has yet to be well understood.

8.2 Socio-affective factors

Socio-affective factors such as motivation to acquire native-like fluency and a sense of affiliation with the L2 community (identity) are also important for one's ultimate attainment in L2. A number of case studies of successful L2 learners highlight the importance of socio-affective factors in achieving high proficiency in L2 (e.g., Bongaerts 1999; Moyer 1999). Moyer (2004) reported that affective factors such as learners' motivation to acquire high fluency in German (L2) and their self-satisfaction with their attainment accounted for as much as 76% of the variances in L2 attainment. In Toda (2006), among her 100 adult learners of Japanese in Japan with higher AOs (AO > 13), seven individuals who were judged as having near-native pronunciation all indicated having a strong motivation for sounding like a native speaker, and making a conscious and consistent effort to work on their pronunciation using various resources. Affective factors also relate to the amount of contact with native speakers and influence language dominance. Jia and Aaronson (2003) showed that early learners (AO < 9) display a preference for the target culture and were more willing to communicate with peers in their L2, which in turn resulted in a shift of language dominance from L1 to L2. On the contrary, older learners tended to maintain L1 cultures and social networks. Learners' choice of a target model also seems to affect their performance. Piller (2002) showed that there are individual differences among late learners in terms of their willingness to follow native speech as a target model. Some learners may see a benefit to having a foreign accent and choose a non-native or non-standard variety as their model. This decision was associated with variation of perceived native-likeness in their speech.

8.3 Environmental factors

The role of environmental factors cannot be underestimated. As we have seen already, quality of input needs to be more thoroughly investigated. The successful late learners in Bongaerts (1999) and Moyer (1999) were not only highly motivated but also received high-quality instruction in L2. Exceptionally successful late learners were also found to have spent a relatively short period of time abroad (Nikolov

2000). The relationship between input and language acquisition seems to be more complicated than one might assume, however. It is well documented that children receive linguistically modified input according to their age (known as *child-directed speech*). Adults also adjust the action (i.e., slower and over-action, known as *motionese*) that accompanies their speech to make their communicative intent more salient to children (Brand, Baldwin, and Ashburn 2002). Such adjustments are considered to help children acquire language. However, we also know that native speakers modify their speech to older L2 learners, adjusting their speech to the learners' proficiency level (known as *foreigner's talk*). Child-directed speech is not necessarily universally observed; in some communities, adults do not directly address children until they reach a certain level of competency (Ochs 1982; Schieffelin 1979). It has also been reported that older learners can more actively engage in conversation and are better at generating input than younger learners (Muñoz 2002, 2009). Some suggest that young children benefit from implicit learning, which requires massive input (e.g., Bley-Vroman 1989). As we shall see below, in the context of foreign language learning, if young learners do not have such massive input, they do not acquire high proficiency. On the contrary, if later learners have a chance to receive implicit-based instruction, they show a native-like brain activity pattern (Morgan-Short and Ullman 2012). The efficiency of such instruction to adults can be a matter of pedagogical debate, however. In addition to the input/instruction, other factors such as learners' educational background, socio-economic status, and the typological distance between L1 and L2 also seem to influence their ultimate attainment of L2 (e.g., Birdsong and Molis 2001; Hakuta, Bialystok and Wiley 2003).

In sum, the CHP debate seems to extend to various age-related factors other than neurological/biological factors. It has been suggested that research must consider these age-related confounding factors more thoroughly and systematically, although, in practice, separating them from the age factor is highly complicated methodologically (DeKeyser 2012).

9 Multiple dynamic age effects (but not multiple critical periods)

We have reviewed studies on the CPH and/or age effects on ultimate L2 attainment. We found that researchers disagree on whether a critical period exists. Researchers also disagree about the linguistic domains affected by the critical period and propose different onset and offset times. Moreover, various factors have been claimed to be responsible for the critical period and/or the age effects on ultimate attainment in L2. There seem to be individual differences among learners as well. A number of very successful late starters have been reported, though it is still controversial whether these individuals indeed obtained native-level proficiency.

Based on these findings, I would argue that there seem to be multiple dynamic age effects (but not a designated critical period or multiple critical periods per se). Depending on the domains or particular tasks/instruments used in the study, as well as the analytical methods employed, some researchers find a discrepancy in performance at a certain AO, while others find a linear or non-linear decline in performance as AO increases. Individual differences were evident as well. Taking all of this together, it is hard to identify a designated critical period or multiple critical periods. Rather, multiple age effects are observed. Taking a dynamic approach to language (Larsen-Freeman and Cameron 2008), this can be interpreted as a result of dynamic and complicated interplays among various age-related factors (including both internal and external factors).

Neurological studies tell us that brain development is not linear but is multifaceted. The development of different neurological functions may have different types of maturational constraints. According to Uylings (2006), at different phases, a designated function must be established within a set-time frame. As a result, as described in (C) and (D) in Figure 2, different functions show different developmental patterns; they are differently constrained by age. Another type of learning, *experience learning*, involves “local dendritic and synaptic alternations,” and its plasticity is much less constrained by age (Uylings 2006: 73). Its plasticity may not be totally unchanged but a gradual decline in adulthood may be inhibited through certain strategies. In Figure 2, (E) represents such a case.

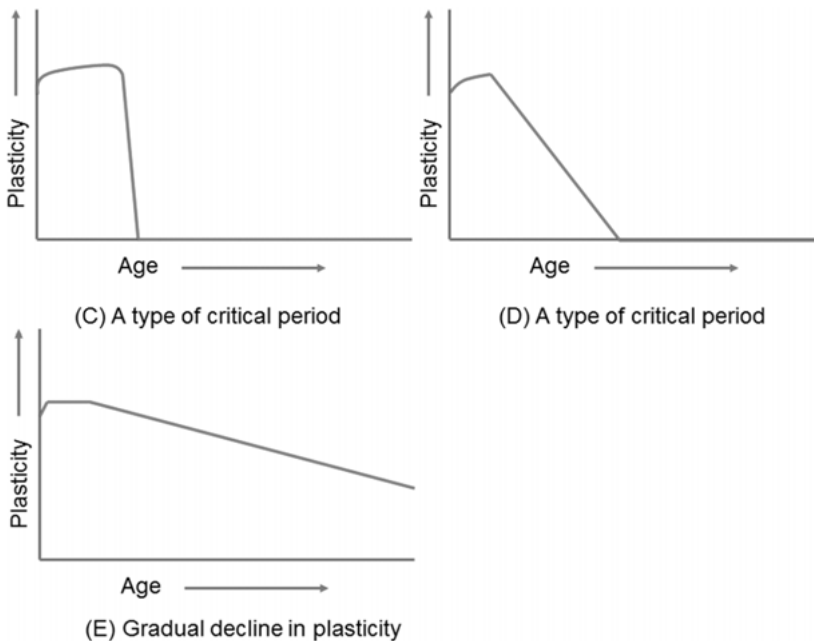


Figure 2: Different patterns of plasticity (Uylings 2006: 74)

We know that linguistic knowledge and processing are very complex cognitive and neurological phenomena where a number of neurological functions are involved in complicated and dynamic ways. Some language knowledge and processing may be relatively simpler than others. Depending on which neurological functions are involved and how multiple functions with different developmental patterns interact with one another, we may end up observing different attainments. More complicated linguistic activities may have weaker age effects because the large number of neurological functions may compensate for one another's maturational constraints and may help to retain certain abilities later in life, possibly by establishing specific strategies. Most importantly, at any given developmental phase, neurological functions dynamically interact with various age-related factors and constantly adapt themselves to new environments. This may explain why we see individual differences in the previous studies.

10 Age effects in foreign language context

Investigation of age effects in L2 in less-intensive learning contexts, most typically foreign language learning contexts, has gained substantial attention in recent years. Although this type of inquiry does not directly speak to the issue of the CHP, it may provide us with unique information regarding the role of input and other environmental factors in L2 development in relation to age. Given the fact that a growing number of countries and regions have begun implementing foreign language programs with younger and younger children, inquiry into age effects in foreign language contexts also has potential practical consequences for policy making and curriculum development.

Earlier studies examining the rate of L2 development between younger and older learners in a naturalistic context have reported that older learners have an initial advantage in the short run, but younger learners may catch up with the older learners relatively quickly and have a long-run advantage. According to Snow and Hoefnagel-Höhle (1978), a frequently cited study, younger starters can outperform older starters after one year. Although this is the case in a naturalistic setting, it has often been assumed that younger learners have a similar advantage in foreign language instructional settings as well.

However, recent studies, most of which come from Europe, indicate that this assumption is not necessarily warranted (García Mayo and García Lecumberri 2003; Muñoz 2014). For example, the Barcelona Age Factor (BAF) project, a longitudinal study conducted from 1995 to 2004, showed that young starters (AO = 8) only slowly caught up with older learners in some linguistic measures after receiving 726 hours of instruction over a period of eight years. The results also indicated that the learners' morphosyntax performance was boosted at around the age of 12. On the other hand,

auditory abilities were not affected by the learners' age but rather by the amount of exposure (Muñoz 2006, 2009). The initial advantage of older learners may be attributed to their advanced cognitive maturity, at least in the morphosyntax domain, while the phonology domain may be less constrained by cognitive maturity. The belief that younger learners have a better chance to acquire more native-like pronunciation is not necessary warranted either if they were exposed to L2 accented input from their teachers. Muñoz (2014) found that the extent to which learners received high-quality input was a stronger predictor of their oral performance than AO.

Ojima et al. (2011), using both a behavioral measure (standardized proficiency test scores) and a neuroimaging measure (event-related brain potentials, or ERPs) among Japanese children learning English as their foreign language, found that later starters of English learning, rather than earlier starters, showed higher English scores and larger N400 amplitudes, after controlling for the hours of instruction received (see also Chapter 10 in this volume). Butler and Takeuchi (2008), in their large-scale study among English-learning children in Japan, discovered that both the total hours of instruction and the hours of instruction per week had negative correlations with the learners' general English proficiency at the third- and fourth-grade levels, but positive correlations at the fifth- and sixth-grade levels. Based on this result, the Butler and Takeuchi (2008: 92) suggested that "the effect of the one-hour of English instruction typically seen in elementary schools in Japan may have a qualitatively different impact on students' performance across grade levels."

Singleton (1989) estimated that young learners may need 18 years of instruction in a foreign language instructional setting to catch up with older learners. If this estimate is accurate, most early starters finish their foreign language programs before they can catch up with older starters.

Muñoz (2009) also suggested that younger learners can get more benefit from implicit learning. But implicit learning requires a massive amount of exposure to the target language and most foreign language programs cannot provide learners with such substantial input. Even in an immersion context where learners can have substantially greater exposure to the target language than they would in regular foreign language programs, Harada (2006) found that English-speaking children (Grade 1 to 5) who had been enrolled in a Japanese total immersion program beginning in kindergarten did not show identical phonetic categories with those of monolingual Japanese-speaking children. The English-speakers' pronunciation of single and geminate stop sounds in Japanese (e.g., /t/ vs. /tt/) was significantly different from native Japanese-speaking counterparts based both on an accent rating and acoustic analyses made of closure duration of singles and geminates despite the fact that some of the participants (Grade 5 students) had received approximately 4,400 hours of instruction in Japanese.

Though we still have limited information about the age effect in foreign language instructional contexts, it seems that we cannot simply assume that younger starters have an advantage over older learners without carefully examining the amount and

type of input that they receive. The relative distance between learners' L1 and L2 may also have a stronger effect than the AO in foreign language contexts (Matsui 2000).

11 Conclusion and future research

As we have seen, the question of whether a critical period exists in L2 learning is far from settled. Researchers disagree about the definition of a critical period itself, the existence of a critical period or periods, the onset and offsets of any critical period, the domains affected by age effects, and the reasons for any critical periods. A number of methodological challenges have been addressed as well. One of the most common research methods has been to compare the performance of L2 learners with different AOs with that of “native speakers.” As exemplified by such studies, previous research tended to be trapped in a static notion of neurobiological programming and language ability. L2 learners' language is constantly changing according to the environment, and so is that of native speakers. Since neurological functions develop with different maturational constraints and dynamically interact with various internal and external factors, it is not too surprising that researchers find different critical periods or different types of age effects across domains or across different sub-domains within a given domain. As biologists have recognized the importance of cultural transmission among animals, Dual Inheritance Theory has gained popularity. The theory predicts that “the mature phenotypes of many species are seen to depend on what they inherit from their forebears both biologically and culturally” (Tomasello 1999: 14) and considers human language development to be one of the best examples. In investigating the CPH and age effects, therefore, it is now time to pay more serious attention to such dynamic interactions between neurobiological and environmental factors, rather than to compare “cutouts” of performance in a decontextualized fashion.

Perhaps “Is there a critical period in L2?” is not the question to investigate. Instead, we should ask, “How do various factors dynamically interact with age over time, and how can we best optimize learners' abilities to acquire L2 at different ages?” Methodologically, these are not easy questions to tackle, and they require multiple research tools as well as strategies and wisdom from various disciplines.

Finally, as I note in the introduction, the scarcity of information on age effects in Japanese language acquisition is undeniable. With the exception of the handful of studies (even including unpublished studies) that I cite in this chapter that examine the age factor systematically among learners of Japanese, most research on this topic has been conducted predominantly in European language learning contexts. Because Japanese is typologically very different from European languages, it is poised to make a unique contribution to the literature by enhancing our understanding on the complex nature of age effects in L2 acquisition. There is no question that more research in Japanese is called for.

References

- Abrahamsson, Niclas. 2012. Age of onset and nativelike L2 ultimate attainment of morphosyntactic and phonetic intuition. *Studies in Second Language Acquisition* 34(2). 187–214.
- Abrahamsson, Niclas and Kenneth Hyltenstam. 2009. Age of onset and nativelikeness in second language. *Language Learning* 59(2). 249–306.
- Bialystok, Ellen and Kenji Hakuta. 1994. *In other words: The science and psychology of second-language acquisition*. New York, NY: Basic Books.
- Birdsong, David. 1992. Ultimate attainment in second language acquisition. *Language*, 68(4). 706–755.
- Birdsong, David. 1999. Introduction: Whys and why nots of the critical period hypothesis for second language acquisition. In David P. Birdsong (ed.), *Second language acquisition and the critical period hypothesis*, 1–22. Mahwah, NJ: Lawrence Erlbaum.
- Birdsong, David. 2005. Nativelikeness and non-nativelikeness in L2A research. *International Review of Applied Linguistics* 43(4). 319–328.
- Birdsong, David. 2006. Age and second language acquisition and processing: A selective review. *Language Learning* 56(1). 9–49.
- Birdsong, David. 2007. Nativelike pronunciation among late learners of French as a second language. In Ocke-Schwen Bohn and Murray J. Munro (eds.), *Language experience in second language learning. In honor of James Emil Flege*, 99–116. Philadelphia, PA: Benjamins.
- Birdsong, David and Michelle Molis. 2001. On the evidence for maturational constraints in second-language acquisition. *Journal of Memory and Language* 44(2). 235–249.
- Bley-Vroman, Robert. 1989. What is the logical problem of foreign language learning? In Susan M. Gass and Jacquelyn Schachter (eds.), *Linguistics perspectives on second language acquisition*, 41–68. Cambridge, UK: Cambridge University Press.
- Bongaerts, Theo. 1999. Ultimate attainment in L2 pronunciation: The case of very advanced late L2 learners. In David Birdsong (ed.), *Second language acquisition and the critical period hypothesis*, 133–159. Mahwah, NJ: Lawrence Erlbaum.
- Bongaerts, Theo. 2005. Introduction: Ultimate attainment and the critical period hypothesis for second language acquisition. *International Review of Applied Linguistics* 43(4). 259–267.
- Bongaerts, Theo, Susan Mennen and Frans van der Slik. 2000. Authenticity of pronunciation in naturalistic second language acquisition: The case of very advanced late learners of Dutch as a second language. *Studia Linguistica* 54(2). 298–308.
- Brand, Rebecca J., Dare A. Baldwin and Leslie A. Ashburn. 2002. Evidence for “motionese”: Modifications in mothers’ infant-directed action. *Developmental Science* 5(1). 72–83.
- Butler, Yuko Goto. 2000. The age effect in second language acquisition: Is it too late to acquire native level competence in a second language after the age of seven? In Yuriko Oshima-Takane, Yasuhiro Shirai and Hidetoshi Sirai (eds.), *Studies in Language Sciences* 1, 159–169. Tokyo, Japan: The Japanese Society for Language Sciences.
- Butler, Yuko Goto. 2013. Bilingualism/multilingualism and second language acquisition. In Tej K. Bhatia and William C. Ritchie (eds.), *The handbook of bilingualism and multilingualism*, 2nd edn., 109–136. Malden, MA: Blackwell.
- Butler, Yuko Goto and Asako Takeuchi. 2008. Variables that influence elementary school students’ English performance in Japan. *Journal of Asia TEFL* 5(1). 61–91.
- Bylund, Emanuel, Niclas Abrahamsson and Kenneth Hyltenstam. 2012. Does first language maintenance hamper nativelikeness in a second language?: A study of ultimate attainment in early bilinguals. *Studies in Second Language Acquisition* 34(2). 215–241.
- Coppieters, Rene. 1987. Competence differences between native and near-native speakers. *Language* 63(3). 544–573.

- Cook, Vivian. 1992. Evidence for multicompetence. *Language Learning* 42(4). 557–591.
- De Angelis, Gessica. 2007. *Third or additional language acquisition*. Clevedon, UK: Multilingual Matters.
- De Groot, Annette M. B. 2011. *Language and cognition in bilinguals and multilinguals*. New York, NY: Psychology Press.
- DeKeyser, Robert. 2000. The robustness of critical period effects in second language acquisition. *Studies in Second Language Acquisition* 22(4). 499–534.
- DeKeyser, Robert. 2012. Age effects in second language learning. In Susan M. Gass and Alison Macky (eds.), *The Routledge handbook of second language acquisition*, 442–460. London, UK and New York, NY: Routledge.
- DeKeyser, Robert and Jennifer Larson-Hall. 2005. What does the critical period really mean? In Judith F. Kroll and Annette M. B. de Groot (eds.), *Handbook of bilingualism: Psycholinguistic approaches*, 88–108. Oxford, UK: Oxford University Press.
- Dempster, Frank N. 1981. Memory span: Sources of individual and developmental differences. *Psychological Bulletin* 89(1). 63–100.
- Emmorey, Karen, Ursula Bellugi, Angela Friederici and Petra Horn. 1995. Effects of age of acquisition on grammatical sensitivity: Evidence from on-line and off-line tasks. *Applied Psycholinguistics* 16(1). 1–23.
- Flege, James Emil. 1999. Age of learning and second language speech. In David Birdsong (ed.), *Second language acquisition and the critical period hypothesis*, 101–131. Mahwah, NJ: Lawrence Erlbaum.
- Flege, James Emil. 2009. Give input a chance! In Thorsten Piske and Martha Young-Scholten (eds.), *Input matters in SLA*, 175–190. Bristol, UK: Multilingual Matters.
- Flege, James Emil, Elaina M. Frieda and Takeshi Nozawa. 1997. Amount of native-language (L1) use affects the pronunciation of an L2. *Journal of Phonetics* 25(2). 169–186.
- Flege, James Emil and Serena Liu. 2001. The effect of experience on adults' acquisition of a second language. *Studies in Second Language Acquisition* 23(4). 527–552.
- Flege, James Emil, Murray J. Munro and Ian R. A. MacKay. 1995. Factors affecting strength of perceived foreign language accents in a second language. *Journal of the Acoustical Society of America* 97(5). 3125–3134.
- Flege, James Emil, Grace H. Yeni-Komshian and Serena Liu, S. 1999. Age constraints on second-language acquisition. *Journal of Memory and Language* 41(1). 78–104.
- Fry, Astrid F. and Sandra Hale. 2000. Relationships among processing speed, working memory, and fluid intelligence in children. *Biological Psychology* 54(1–3). 1–34.
- Fujinaga, Tamotsu. 1997. Yōiku hōkirei to kotoba no hattatsu [Cases of deprived children and their language development]. In Hiromi Kobayashi and Masato Sasaki (eds.), *Kodomotachi no gengo shūtoku [Children's language development]*, 153–184. Tokyo, Japan: Taishukan.
- García Mayo, María del Pilar and María Luisa García Lecumberri (eds.). 2003. *Age and the acquisition of English as a foreign language*. Clevedon, UK: Multilingual Matters.
- Granena, Gisela and Michael H. Long. 2012. Age of onset, length of residence, aptitude and ultimate L1 attainment in three linguistic domains. *Second Language Research* 29(3). 311–343.
- Grosjean, Francois. 1998. Studying bilinguals: methodological and conceptual issues. *Bilingualism: Language and Cognition* 1(2). 131–149.
- Hahne, Anja. 2001. What's different in second language processing? Evidence from event-related brain potentials. *Journal of Psycholinguistic Research* 30(3). 251–266.
- Hahne, Anja and Angela D. Friederici. 2001. Processing a second language: Late learners' comprehension mechanisms as revealed by event-related brain potentials. *Bilingualism: Language and Cognition* 4(2). 123–141.

- Hakuta, Kenji. 2001. A critical period for second language acquisition? In Donald Bailey, John T. Bruer, Frank Symons and Jeff W. Lichtman (eds.), *Critical thinking about critical periods*, 193–205. Baltimore, MD: Paul H. Brookes.
- Hakuta, Kenji, Ellen Bialystok and Edward Wiley. 2003. Critical evidence: A test of the critical period hypothesis for second language acquisition. *Psychological Science* 14(1). 31–38.
- Harada, Tetsuo. 2006. The acquisition of single and geminate stop by English-speaking children in a Japanese immersion program. *Studies in Second Language Acquisition* 28. 601–632.
- Hasegawa, Tomomi. 2008. The critical period hypothesis in second language acquisition: Paving the way to L2 Japanese research. *Japanese Language Education*, November 2008 Special Issues. 107–137.
- Herdina, Phillip and Ulrike Jessner. 2000. *A dynamic model of multilingualism: Changing the psycholinguistic perspective*. Clevedon, UK: Multilingual Matters.
- Huang, Becky H., and Sun-Ah Jun. 2011. The effect of age on the acquisition of second language prosody. *Language and Speech* 54(3). 387–414.
- Hyltenstam, Kenneth and Niclas Abrahamsson. 2000. Who can become native-like in a second language? All, some or none? On the maturational constraints controversy in second language acquisition. *Studia Linguistica* 54(2). 150–166.
- Hyltenstam, Kenneth and Niclas Abrahamsson. 2003. Maturational constraints in SLA. In Catherine J. Doughty and Michael H. Long (eds.), *The handbook of second language acquisition*, 539–588. Oxford, UK: Blackwell.
- Ioup, Georgette, Elizabeth Boustagoui, Manal El Tigi and Martha Mosselle. 1994. Reexamining the critical period hypothesis: A case of successful adult SLA in a naturalistic environment. *Studies in Second Language Acquisition* 16(1). 73–98.
- Jia, Gisela and Doris Aaronson. 2003. A longitudinal study of Chinese children and adolescents learning English in the United States. *Applied Psycholinguistics* 24(1). 131–161.
- Johnson, Jacqueline S. and Elissa L. Newport. 1989. Critical period effects in second language learning: The influence of maturational states on the acquisition of English as a second language. *Cognitive Psychology* 21(1). 60–99.
- Kaan, Edith. 2007. Event-related potentials and language processing: A brief overview. *Language and Linguistics Compass* 1(6). 571–591.
- Kataoka, Hiroko, Yasuko Koshiyama and Yoshiko Mori. 2008. Amerika no hoshūkō de manabu kodomotachi no eigo to nihongo no chikara [English and Japanese abilities among children learning at hoshūkō in the U.S.]. In Gunei Sato and Hiroko Takaoka (eds.), *Amerika de sodatsu nihon no kodomotachi [Japanese children growing up in the U.S.]*, 117–142. Tokyo, Japan: Akashi Shoten.
- Larsen-Freeman, Diane and Lynne Cameron. 2008. *Complex systems and applied linguistics*. Oxford, UK: Oxford University Press.
- Larson-Hall, Jennifer. 2006. What does more time buy you? Another look at the effects of long-term residence on production accuracy of English /ɹ/ and /l/ by Japanese speakers. *Language and Speech* 49(4). 521–548.
- Lenneberg, Eric H. 1967. *Biological foundation of language*. New York, NY: Wiley and Sons.
- Li, Bi-sei. 2006. *Chūnichi nigengo-no bairingarizumu* [Chinese-Japanese bilingualism]. Tokyo: Kazama Shobō.
- Long, Michael. 1990. Maturational constraints on language development. *Studies in Second Language Acquisition* 12(3). 251–285.
- Long, Michael. 2005. Problems with supposed counter-evidence to the Critical Period Hypothesis. *International Review of Applied Linguistics* 43(4). 287–317.
- MacWhinney, Brian. 2005. A unified model of language acquisition. In Judith F. Kroll and Annette M. B. Degroot (eds.), *Handbook of bilingualism: Psycholinguistic approaches*, 49–67. Oxford, UK: Oxford University Press.

- Marinova-Todd, Stefka H., D. Bradford Marshall and Catherine E. Snow. 2001. Missing the point: A response to Hytlenstam and Abrahamsson. *TESOL Quarterly* 35(1). 171–176.
- Matsui, Shiro. 2000. *The relevance of the native language in foreign language acquisition: The critical period hypothesis for foreign language pronunciation*. Unpublished doctoral dissertation. Austin, TX: The University of Texas at Austin.
- Morgan-Short, Kara and Michael T. Ullman. 2012. The neurocognition of second language. In Susan M. Gass and Alison Macky (eds.), *The Routledge handbook of second language acquisition*, 282–299. London, UK, and New York, NY: Routledge.
- Moyer, Alene. 1999. Ultimate attainment in L2 phonology. The critical factors of age, motivation and instruction. *Studies in Second Language Acquisition* 21(1). 81–108.
- Moyer, Alene. 2004. *Age, accent and experience in second language acquisition*. Clevedon, UK: Multilingual Matters.
- Moyer, Alene. 2007. Empirical considerations on the age factor in L2 phonology. *Issues in Applied Linguistics* 15(2). 109–127.
- Moyer, Alene. 2009. Input as a critical means to an end: Quantity and quality of experience in L2 phonological attainment. In Thorsten Piske and Martha Young-Scholten (eds.), *Input matters in SLA*, 159–174. Bristol, UK: Multilingual Matters.
- Muñoz, Carmen. 2002. Codeswitching as an accommodation device in L3 interviews. Paper presented at the 12th EUROSLA Conference, Basilea, 18–21 September.
- Muñoz, Cameron. (ed.). 2006. *Age and the rate of foreign language learning*. Clevedon, UK: Multilingual Matters.
- Muñoz, Carmen. 2009. Input and long-term effects of early learning in a formal setting. In Marianne Nikolov (ed.), *Contextualizing the age factor: Issues in early foreign language learning*, 141–160. Berlin, Germany: Mouton de Gruyter.
- Muñoz, Carmen. 2014. Contrasting effects of starting age and input on the oral performance of foreign language learners. *Applied Linguistics* 35(4). 463–482.
- Newport, Elissa. 1990. Maturational constraints on language learning. *Cognitive Science* 14(1). 11–28.
- Newport, Elissa, Daphne Bavelier and Helen J. Neville. 2001. Critical thinking about critical periods: Perspectives on a critical period for language acquisition. In Emmanuel Dupoux (ed.), *Language, brain, and cognitive development: Essays in honor of Jacques Mehler*, 481–502. Cambridge, MA: MIT Press.
- Nikolov, Marianne. 2000. The critical period hypothesis reconsidered: Successful adult learners of Hungarian and English. *International Review of Applied Linguistics* 38(2). 109–124.
- Nishikawa, Tomomi. 2014. Nonnativeness in near-native child L2 starters of Japanese: Age and the acquisition of relative clauses. *Applied Linguistics* 35(4). 504–529.
- Ochs, Elinor. 1982. Talking to children in Western Samoa. *Language in Society* 11(1). 77–104.
- Ojima, Shiro, Hiroko Matsuba-Kurita, Naoko Nakamura, Takahiro Hoshino and Hiroko Hasegawa. 2011. Age and amount of exposure to a foreign language during childhood: Behavioral and ERP data on the semantic comprehension of spoken English by Japanese children. *Neuroscience Research* 70(2). 197–205.
- Oyama, Susan. 1976. A sensitive period for the acquisition of a nonnative phonological system. *Journal of Psycholinguistic Research* 5(3). 261–283.
- Pallier, Christophe, Stanislas Dehaene, Jean-Baptiste Poline, Denis LeBihan, Anne-Marie Argenti, Emmanuel Dupoux and Jacques Mehler. 2003. Brain imaging of language plasticity in adopted adults: Can a second language replace the first? *Cerebral Cortex* 13(2). 155–161.
- Patkowski, Mark S. 1980. The sensitive period for the acquisition of syntax in a second language. *Language Learning* 30(2). 449–472.
- Penfield, Wilder and Lamar Roberts. 1959. *Speech and brain mechanisms*. New York, NY: Athenaeum.

- Perry, Bruce D. 2002. Childhood experience and the expression of generic potential: What childhood neglect tells us about nature and nurture. *Brain and Mind* 3(1). 79–100.
- Piller, Ingrid. 2002. Passing for a native speaker: Identity and success in second language learning. *Journal of Sociolinguistics* 6(2). 179–206.
- Piske, Thorsten, Ian R. A. MacKay and James E. Flege. 2001. Factors affecting degree of foreign accents in an L2: A review. *Journal of Phonetics* 29(2). 191–215.
- Saito, Kazuya and François-Xavier, Brajot. 2013. Scrutinizing the role of length of residence and age of acquisition in the interlanguage pronunciation development of English /ɹ/ by later Japanese bilinguals. *Bilingualism: Language and Cognition* 16(4). 847–863.
- Schieffelin, Bambi B. 1979. Getting it together: An ethnographic approach to the study of the development of communicative competence. In Elinor Ochs and Bambi B. Schieffelin (eds.), *Developmental pragmatics*, 73–108. New York, NY: Academic Press.
- Scovel, Thomas. 1988. *A time to speak: A psycholinguistic inquiry into the critical period of human speech*. Rowley, MA: Newbury House.
- Scovel, Thomas. 2000. A critical review of the critical period research. *Annual Review of Applied Linguistics* 20. 213–223.
- Seliger, Herbert W. 1978. Implications for a multiple critical period hypothesis for second language learning. In William C. Ritchie (ed.), *Second language acquisition research: Issues and implications*, 11–19. New York, NY: Academic Press.
- Singleton, David. 1989. *Language acquisition: The age factor*. Clevedon, UK: Multilingual Matters.
- Singleton, David. 2003. Critical period or general age factor(s)? In María del Pilar García Mayo and María Luisa García Lecumberri (eds.), *Age and the acquisition of English as a foreign language*, 3–22. Clevedon, UK: Multilingual Matters.
- Singleton, David. 2005. The critical period hypothesis: A coat of many colours. *International Review of Applied Linguistics in Language Teaching* 43(4). 269–285.
- Singleton, David and Carmen Muñoz. 2011. Around and beyond the Critical Period Hypothesis. In Eli Hinkel (ed.), *Handbook of research in second language teaching and language: Vol. II*, 407–415. New York, NY, and London, UK: Routledge.
- Singleton, David and Lisa Ryan. 2004. *Language acquisition: The age factor, 2nd edn*. Clevedon, UK: Multilingual Matters.
- Snow, Catherine E. and Marian Hoefnagel-Hohle. 1978. The critical period for language acquisition: evidence from second language learning. *Child Development* 49(4). 1114–1128.
- Toda, Takako. 2006. *Rinkaiki o sugite gakushū o kaishishita nihongo gakushūsha ni neitebu reberu no hatsuon shūtoku wa kanōka* [Is it possible to acquire native-level of English pronunciation for Japanese-speaking learners who started learning English after the critical period?] Unpublished report on the 2005-2005 Grant-in-Aid for Scientific Research (KAKENHI): Basic Research (C)(2). 9–17.
- Steinhauer, Karsten, Erin J. White, Erin King, S. Cornell, Fred Genesee and Lydia White. 2006. *The neural dynamics of second language acquisition: Evidence from event-related potentials*. Paper presented at the annual meeting of the Cognitive Neuroscience Society, San Francisco, CA, April.
- Steinhauer, Karsten, Erin, J. White and John E. Drury. 2009. Temporal dynamics of late second language acquisition: Evidence from event-related brain potentials. *Second Language Research* 25(1). 13–41.
- Stevens, Gillian. 2006. The age-length-onset problem in research on second language acquisition among immigrants. *Language Learning* 56(4). 671–692.
- Tomasello, Michael. 1999. *The cultural origins of human cognition*. Cambridge, MA: Harvard University Press.

- Ullman, Michael T. 2004. Contributions of memory circuits to language: The declarative/procedural model. *Cognition* 92(1–2). 231–270.
- Uylings, H. B. M. 2006. Development of the human cortex and the concept of “critical” or “sensitive” periods. In Marianne Gullberg and Peter Inderfrey (eds.), *The cognitive neuroscience of second language acquisition*, 59–90. Malden, MA: Blackwell.
- Weber-Fox, Christine M. and Helen J. Neville. 1996. Maturational constraints on functional specializations for language processing: ERP and behavioral evidence in bilingual speakers. *Journal of Cognitive Neuroscience* 8(3). 231–256.
- Weber-Fox, Christine and Helen J. Neville. 2001. Sensitive periods differentiate processing for open and closed class words: An ERP study in bilinguals. *Journal of Speech, Language, and Hearing Research* 44(6). 1338–1358.
- White, Lydia and Fred Genesee. 1996. How native is near-native? The issue of ultimate attainment in adult second language acquisition. *Second Language Research* 12(3). 233–265.

Kazuko Nakajima

4 Cross-lingual transfer from L1 to L2 among school-age children

1 Introduction

Cross-lingual relationships in literacy development between the first language (L1) and the second language (L2) have recently become an area of renewed interest in applied linguistics as well as in the studies of bilingualism and bilingual education. Due to rapid globalization and transnational labor force movements, there is a dramatic increase of school-age children who go through basic education in their second (L2) or third language (L3), while their first language (L1) is required in the home to communicate with their parents. Japan is no exception. Tucker (1999) summarized the situation, pointing out that there are a greater number of bilingual or multilingual children than monolinguals in the world. These children grow up being exposed to dual or multiple languages. Their educators and parents require, quite crucially, knowledge of cross-lingual relationships in planning their upbringing and schooling. The pertinent questions are these: What do we know about cross-lingual relationships or cross-lingual transfer? In what ways can we identify such concepts empirically? What are the pedagogical implications of these concepts for the education of school-age children growing up in multilingual environments?

In this chapter, I will first briefly touch upon two different perspectives in the study of the cross-lingual dimension or transfer in second language acquisition. Second, I will elaborate the linguistic interdependence principle in the light of bilingual education. Third, selected empirical studies will be introduced in detail, with special emphasis on the Japanese language. The rationale for choosing Japanese is that whereas cross-lingual relationships are best investigated for two dissimilar languages whose morpho-syntactical and orthographical structures are different from one another, such as Japanese and English or Japanese and Portuguese, such studies are still regrettably scarce in number. While transfer studies are targeted for both adults and young L2 learners, I will focus on only school children, ages 6–15. To conclude this chapter, the pedagogical implications of cross-lingual relationships in developing bilingual proficiencies, together with concrete instructional strategies to promote transfer, will be discussed in both minority and majority language situations.

2 Theoretical background

2.1 Linguistic transfer or cognitive transfer?

Currently, there are two distinct perspectives often found in transfer research: (1) linguistic transfer from L1 to L2, and (2) general cognitive transfer from previous learning experience, either from L1 to the subsequent language or from L2 to the previously learnt language or both. Those supporting the cross-linguistic transfer position are generally those in second language acquisition (SLA) studies who investigate observable inter-lingual and intra-lingual relationships, such as interference, positive and negative transfer, sentence and language processing and strategies, and the conditions inhibiting or facilitating the transfer. While this SLA approach tends to focus on point-by-point linguistic transfer (e.g., transfer of L1 reading competence to L2 reading ability), the proponents of general cognitive transfer in bilingual development take a global and multidimensional approach. More specifically, in L2 reading studies, for example, the perspective of linguistic transfer is based on the conviction that L2 reading development involves language-specific processes, whereas the perspective of general cognitive transfer is based on the presupposition that reading procedures rest upon component abilities, competencies and skills that are universal across languages. In such research, cross-linguistic variations in language processing are largely ignored, and little attention is given to the precise skill or ability to be transferred from one language to another.

Although these two perspectives on cross-lingual transfer may seem to compete with one another and be mutually exclusive, they are, in fact, complementary, because reading involves both general cognitive skills (e.g., reasoning and inference) and language-processing skills. These two positions thus bear on different aspects of reading behaviors, each can contribute to our understanding of the ways in which previous reading experience influences subsequent development (Koda 1994). Likewise, the proponents of global and cognitive transfer recognize the importance of both perspectives and admit the differing roles to be played by both *linguistic* and *cognitive* transfer in the actual analysis (Fitzgerald and Cummins 1999). In the following section, I will describe the developmental linguistic interdependence principle as an exemplary portion of a theory representing the cognitive and universal perspective of transfer studies, and set out a definition of academic language proficiency that school-age children need to develop in a school context.

2.2 The linguistic interdependence principle

The linguistic interdependence principle has been formally defined as follows: “To the extent that instruction in L_x is effective in promoting proficiency in L_x, transfer of this proficiency to L_y will occur provided there is adequate exposure to L_y (either

in school or environment) and adequate motivation to learn L₂.” (Cummins, 1981: 29) In concrete terms, what this principle means is that although the surface aspects (e.g., pronunciation, fluency, etc.) of different languages are clearly separate, there is an underlying cognitive/academic proficiency that is common across languages. This common underlying proficiency makes possible the transfer of cognitive/academic or literacy-related proficiency from one language to another. Cummins (2005) further argued that the fact that L1 and L2 literacy-related abilities show significant correlations even across quite dissimilar languages such as Japanese and English can be explained by the linguistic interdependence principle. Drawing on an empirical study he jointly conducted (Cummins et al. 1984), he suggested that the common underlying proficiency should be conceived not just as linguistic proficiency but also as involving conceptual abilities. Among those languages derived from Indo-European languages, such as Spanish and English, transfer consists of both linguistic and conceptual elements, but in the case of dissimilar language (e.g., Japanese and English, Japanese and Portuguese), transfer will consist primarily of conceptual and cognitive elements (e.g., learning strategies) (p. 4).

Five types of transfer are possible in the following order, provided that there is adequate motivation and adequate exposure to both languages (Cummins, 2005):

1. Transfer of conceptual elements (e.g., understanding the concept of *photosynthesis*);
2. Transfer of metacognitive and metalinguistic strategies (e.g., strategies of visualizing, use of graphic organizers, mnemonic devices, and vocabulary acquisition strategies);
3. Transfer of pragmatic aspects of language use (willingness to take risks in communication through L₂, ability to use paralinguistic features such as gestures to aid communication);
4. Transfer of specific linguistic elements (knowledge of the meaning of *photo* in *photosynthesis*);
5. Transfer of phonological awareness – the knowledge that words are composed of distinct sounds.

These five items clearly indicate the wide spectrum of the definition of transfer. They are inclusive indeed, from general cognitive transfer (item 1), metacognitive and metalinguistic strategies (item 2), pragmatic aspects of language use (item 3) and phonological awareness (item 5), to the transfer of specific linguistic elements (item 4). Item 4 is considered to be the main theme of transfer studies from SLA perspectives.

The dual iceberg metaphor, in Figure 1, illustrates the two-layered structure of language proficiency: There is the structure on the surface level, where L1 and L2 linguistic elements are language-specific, and the deep structure where language elements are interdependent across languages. Cummins (2000) has called this

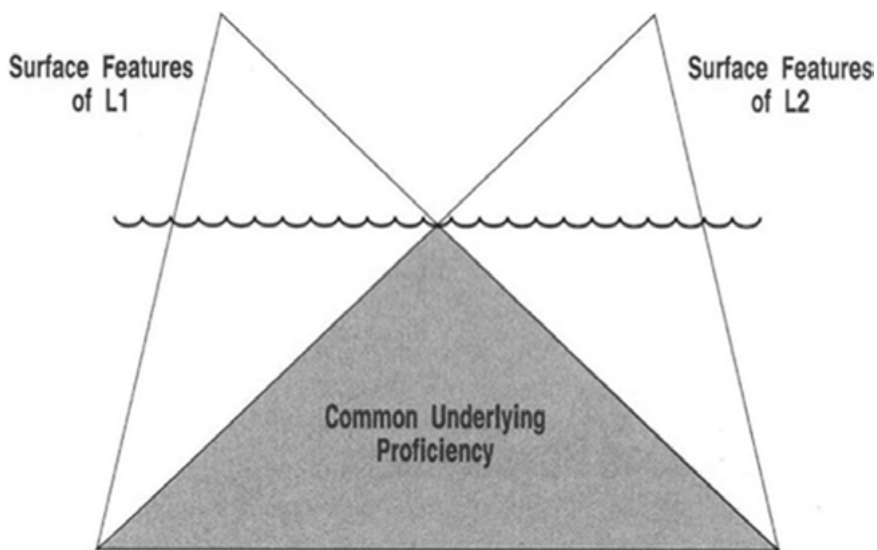


Figure 1: The Dual-Iceberg Representation of Bilingual Proficiency

deep structure, *common underlying proficiency*¹, which he interprets as “concepts, skills and linguistic knowledge that make transfer possible” (p. 191) Experience with either language can promote development of the proficiency underlying both languages, given adequate motivation and exposure to both languages either in school or in the wider environment. For school children growing up in multilingual contexts, the common underlying proficiency especially refers to the cognitive/academic knowledge and abilities that underlie academic performance in both languages.

In the late sixties, Cummins (1979b) proposed that there are two distinct aspects of language proficiency, which were then called CALP and BICS. ‘CALP’ stands for cognitive academic language proficiency and ‘BICS,’ basic interpersonal communicative skills. This distinction was later revised and defined with two axes, cognitively demanding versus cognitively undemanding; and context-reduced versus context-embedded. Thus, CALP was redefined as cognitively demanding and context-reduced, whereas BICS was made cognitively undemanding and context-embedded. These concepts were further revised into three: the first two are conversational fluency (CF) and academic language proficiency (ALP), the equivalent of BICS and CALP,

¹ Slightly different terms were used by different researchers to refer to *Common Underlying Proficiency*. Baker (2001) proposed a Common Operating System, and more recently, Genesee et al. (2006) use the metaphor of a Common Underlying Reservoir of Literacy Abilities (p. 83). Regardless of the terms used, the reality is that research has consistently shown strong relationships between academic development in L1 and L2.

and the third one is discrete language skills (DLS), which was newly added. CF is the dimension of language proficiency that represents the ability to carry on a conversation in face-to-face situations. This fluency involves the use of high-frequency words and simple grammatical constructions. DLS reflect specific phonological, literacy, and grammatical knowledge. These discrete language skills acquired early in life include: (1) knowledge of the letters of the alphabet, (2) knowledge of the sounds represented by individual letters and combinations of letters, and (3) the ability to decode written words. Children can learn these specific language skills concurrently with their development of basic vocabulary and conversational fluency. ALP, on the other hand, means the dimension of proficiency that includes knowledge of less-frequent vocabulary as well as the ability to interpret and produce increasingly complex written language. As students progress through the grades in school, they encounter far more low-frequency words, complex syntax and abstract expressions.

If we tentatively interpret these three distinguished dimensions of language proficiency in terms of transfer studies, we speculate that CF and ALP are interdependent, but DLS are either interdependent or language-specific according to the similarity and dissimilarity of the two languages. In the case of two similar languages, DLS would be interdependent, but between two dissimilar languages (e.g., English and Japanese or Portuguese and Japanese), DLS is proposed to be language-specific.

3 Review of transfer studies

The first extensive review of transfer studies from international perspectives was conducted by Cummins (1991). He reviewed a wide range of studies on cross-lingual relationships under five categories: (1) Finnish minority students in Sweden, (2) Hispanic-background students in the United States, (3) Asian students in Canada and the United States, (4) additional studies of bilingual students including French immersion programs in Canada and other languages, such as Hebrew, Chinese, Malay, Tamil, Turkish, and Portuguese, and (5) studies of adult second-language learners.

Together with the studies reviewed in Cummins (2000), the cumulative number of the empirical studies that he reviewed in published papers is close to 150; the studies extend over the past three decades. The target languages investigated in these studies are more than twenty, and the dimension of linguistic proficiency covers aspects such as reading, writing, vocabulary, grammar, conversational skills, narratives, discourse strategies, general academic skills, and memory span. The directions of transfer were from L1 to L2, or L2 to L1, and L1 to L3, and L2 to L3. He concluded with caution that the data showed consistent moderate relationships between de-contextualized aspects of L1 and L2 proficiency in studies carried out in a wide

variety of sociolinguistic situations and involving subjects ranging in age from early childhood to adult, while relationships tend to be somewhat smaller, albeit still statistically significant, in the case of languages that differ markedly in writing systems.

A more recent review of cross-lingual relationships with school-age children in minority language situations was conducted by a panel of the Center for Research on Education, Diversity & Excellence (CREDE) under the sponsorship of the U.S. government. It is a synthesis of the studies of the past two decades done in the United States in order to improve the education of minority immigrant children or ELL (English language learners) from kindergarten through grade 12, whose ability to reach their potential is challenged by language or cultural barriers, race, geographic location, or poverty. The team investigated a total of 200 peer-reviewed articles and reported on student's progress in three sections, dealing respectively with oral language development, literacy development, and academic achievement. The literacy section, which is most pertinent to this paper, comprises a review of 49 studies that cover various aspects of L1 and L2 relationships. The subcategories of these studies are: (a) L1 or L2 oral proficiency and L2 literacy, (b) phonological awareness, (c) orthographic knowledge, (d) cognate vocabulary, (e) effects of L1 literacy on L2 literacy development, and (f) L1 and L2 learning strategies. In their summary, Genesee et al. (2006), in support of the common underlying proficiency, stated, "Research on this [L1 and L2 literacy] relationship finds that L1 literacy supports L2 literacy development. ELLs with initial L1 literacy experiences, such as emergent and family literacy, as well as those with well-developed L1 literacy experiences, progress more quickly and successfully in L2 literacy development." (p. 83) As a word of caution, however, they also emphasized that much more research is needed to explore cross-language relationships in languages that are not alphabetic and that are otherwise typologically different from English.

Nakajima (2001b) selected 14 transfer studies with Japanese as one of the languages, among approximately 100 studies over the past thirty years, which investigated the cross-lingual relationships between typologically dissimilar languages. These studies met the following criteria: (a) used school-age children as subjects, (b) based on measurement of language skills rather than self-evaluation, (c) conducted later than Peel and Lambert (1962) due to improved research methods, (d) published in reviewed journals or presented at academic conferences. They included the studies on cross-lingual relationship in oral proficiency (e.g., Cummins et al. 1984; Cummins and Nakajima 1985; Nakajima 2001a), vocabulary (e.g., Kataoka et al., 2005; Minami 2003), reading (e.g., Bussinguer and Tanaka 2010; Cummins et al., 1984), and writing (e.g., Cummins and Nakajima 1987; Ikuta 2002; Nakajima et al., 2012). The participants of these studies can be categorized into three groups: (i) heritage language learners born and growing up in the United States or Canada, (ii) the children of Japanese nationals who reside abroad only temporarily for fathers' job-related reasons, and (iii) Japanese language learners, JLL, the children of foreign

workers enrolled in Japanese public schools. In later sections, four major studies, two from groups (i) and/or (ii), and two from group (iii) above, will be chosen for detailed exposition.

One significant development worth mentioning here is the studies on cross-MODAL interdependence between sign language and the written form of societal language. Cummins (2011) conducted an extensive review on the empirical studies of the past twenty years, covering various skill areas, such as reading, writing, vocabulary, narratives, and grammatical accuracy. For example, Prinz and Strong (1998), who studied the cross-lingual relationship between American Sign Language (ASL), and English academic proficiency, found that ASL skill is significantly correlated with English literacy, and the children of deaf mothers outperformed children with hearing mothers in both ASL and English reading and writing. Further, the investigators reported evidence that the differences in English literacy between children of deaf mothers and children of hearing mothers could be attributed to the differences in ASL proficiency between these two groups. When ASL level was held constant, differences in English literacy performance disappeared for the high and medium ASL groups, while differences remained the same among the low ASL group. Prinz and Strong (1998) concluded that the finding suggested that ASL skills might explain the different academic performance between the two groups – a notion that was consistent with Cummins' theory of cognitive and linguistic interdependence. (p. 53)

Linguistic interdependence between sign language and written language is also reported in a study that involved 15 deaf students aged 13–17 by Menéndez (2010) in Catalonia, Spain. Students were attending a bilingual school in which Catalan Sign Language was used to support the acquisition of written skills in Catalan, Spanish and English. Menéndez (2010), whose analysis provided evidence of extensive positive transfer across languages, presented his conclusions: "Empirical data provided in this study show evidence of linguistic transfer from SL to written English at the lexical, morphological and syntactic levels. Other data presented in the literature review show linguistic transfer at a pragmatic level (story grammar, narrative and cohesion)." (p. 218)

After reviewing these ASL studies, Cummins (2011) concludes that the research evidence shows consistent significant relationships between students' proficiency in ASL and their development of English reading and writing skills. Thus, the interdependence hypothesis appears to apply equally to the relationship between ASL and English as it does to the relationship between spoken languages.

In the following sections, four studies on cross-lingual transfer between two dissimilar spoken languages are discussed in detail. The languages involved in Studies I and IV are English and Japanese, while those in Studies II and III are Portuguese and Japanese.

4 Study I: Cross-lingual interdependence between Japanese and English in reading, vocabulary, and conversational skills

This study was conducted first in 1980-81 (Cummins et al. 1984), and two years later, a small-scale follow-up study was performed with 17 of the Japanese-speaking children to see the change of proficiencies shown by these students. This follow-up was intended to address the problems inherent in the cross-sectional approach of the first study. Subsequently, the study continued addressing the bilingual writing skills of the Japanese children in the same school (Cummins and Nakajima 1987). In the present review, only the results of the first study will be discussed in detail. The study as a whole has a historical value because, in it, Cummins tested his own theory with non-European languages, Japanese/English and Vietnamese/English, which have little in common at a surface level. The objectives of this study were multiple: the reexamination of the notion of “common underlying proficiency”, the two dimensions of language proficiency, BICS or context-embedded and CALP or context-reduced, the role of first language in the acquisition of the second language; and comparison between two age groups in the rate of L2 acquisition and L1 attrition. Positive results emerged from this study, supporting Cummins’ theory: Japanese reading comprehension and vocabulary were positively correlated with English reading comprehension and vocabulary, despite the fact that these two languages are typologically dissimilar.

4.1 Background, data collection and analysis

The data were collected from 91 children of group (ii) (see Section 3) or hoshūkō children in Toronto, Canada, in two age groups: (a) grades 2–3 and (b) grades 5–6. The children’s length of residence (LOR) in English-speaking countries was from six months to seven years. Hoshūkō is a weekend program supported by the Ministry of Education and Science and Ministry of Foreign Affairs of Japan. One of the objectives of hoshūkō is to prepare the students to make the transition to reintegrate into Japanese schooling and society. Thus, parents and the children have strong motivation and incentive to maintain an age-appropriate level of Japanese language proficiency and academic skills because most of the families intend to go back to Japan when their father’s overseas posting is over. The program started in the 1950s as Japanese business became globally active; now there are approximately 65,000 hoshūkō students around the world (www.mext.go.jp). Compared with a typical immigrant group, Japanese families have good economic circumstances, English-as-a-second language support is provided in most public schools in Toronto, and the

development of Japanese academic skills is promoted by the hoshūkō program. In other words, in the 1980s and 1990s, although Japanese children were categorized as “immigrant children” or “minority language children”, in reality hoshūkō children were in an optimal situation in terms of bilingual and biliterate development. Needless to say, it presents us a unique opportunity to look into how two language proficiencies, both in BICS and CALP, evolve and to learn about the cross-lingual and cross-dimensional relationships without the students being affected by the societal, hindering factors that minority language children usually suffer.

The academic contents of hoshūkō vary from school to school, depending on the size of the enrolment and the local administrative body. In the case of Toronto Hoshūkō, which opens only on Saturdays from 9:00 a.m. to 2:35 p.m., five academic subjects are taught according to the national curriculum in Japan: language arts, mathematics, science, social studies, and life studies (grades one and two only). A principal and vice-principal are regularly dispatched from Japan for three years each, if the enrolment is close to 500. Based on my professional experiences of visiting various hoshūkō schools for teacher-training, I can say that Toronto Hoshūkō has one of the most vigorous academic program of the weekend “heritage language” or L1 maintenance programs.

The two age groups were given a group test for Japanese measures and English measures. For the Japanese measures, grade 2 and grade 5 versions of standardized reading comprehension tests were used, whereas, for English measures, a variety of tests were used including Gates-MacGinitie Grade 2 Vocabulary and Reading Test, a written *Prepositional Usage Test* (Wright and Ramsey 1970) and the Antonyms and Sentence Repetition subtests of the *Language Assessment Umpire* (Cohen 1980). In addition to these language data, we have collected a parental questionnaire of 30 items which consists of two broad categories: *background items* such as biological age, age of arrival (AOA), gender, personality, and *exposure/behavior items* such as length of residence (LOR), home language use, hours of study for Japanese or English.

Scores of reading and vocabulary tests and the oral interview scores were put together for factor analysis. Three factors emerged in English and in Japanese. These factors were used for correlational analysis to see how English and Japanese scores are related. Subsequently multiple regression analysis was also conducted with these factors as dependent variables.

4.2 Findings

4.2.1 Cross-lingual dimension of L1 and L2 academic language proficiency

In order to test the interdependence hypothesis, partial correlations controlling for LOR were computed between Japanese academic language proficiency (ALP) and age

on arrival (AOA) on the one hand, and the English academic language proficiency variables, on the other. Table 1 shows all the correlations between English cognitive/academic measures and both Japanese academic language proficiency and AOA, which are significant (using one-tailed tests) in the predicted direction. Moderately strong relationships were observed between reading performance in Japanese and English, $r = .52$ ($p < .01$), despite the vast difference in their orthographical systems. Vocabulary also showed a positive correlation, $r = .44$ ($p < .01$).

Table 1: Correlations between English ALP Measures and Both Japanese ALP and Age on Arrival Controlling for Length of Residence

Variable	Japanese ALP		Age on arrival	
	<i>N</i> = 57	<i>N</i> = 88	<i>N</i> = 57	<i>N</i> = 88
1. Vocabulary	.42**	.44**	.22*	.30**
2. Reading	.46**	.52**	.29*	.38**
3. Prepositions	.22*	.23*	.25*	.30**
4. Antonyms	.30**		.37**	
5. Sentence repetition	.31**		.11	
6. English ALP	.33**		.33**	

** $p < .01$ (one-tailed), * $p < .05$ (one-tailed), $p > .05$ (two-tailed).

These correlations are clearly consistent with the interdependence principle, especially since variance due to age has been removed from Japanese academic language proficiency to express scores in relation to grade norms.

The second step for testing the interdependence theory was multiple regression analysis with English reading on LOR and cognitive/academic predictor variables including biological age and AOA. It can be seen in Table 2 that LOR accounted for 30% of the variance in English reading. Japanese academic language proficiency accounted for an additional 19% and, together with other age related-variables, brought the total explained variance to 53%.

Table 2: Regression of English Reading on LOR and Cognitive/Academic Predictor Variables (*N* = 91)

	Multiple R	R square	R square change	Simple R
	.55	.30	.30	.55
Japanese Academic Language Proficiency	.70	.49	.19	.23
AOA (older group)	.73	.53	.04	-.03
Age	.73	.53	.01	.40

The third step taken was the analysis of age-group comparisons with the assumption that, when LOR was controlled, older children would perform better on

English cognitive academic measures. The *t*-test results show significant differences in favor of the older group on English vocabulary, English reading, and antonyms. In four out of five (80%) English context-reduced tasks, significant ($p < .05$) differences were observed in favor of older students; on the Japanese variables, the older students performed better on all except for pronunciation and use of English (i.e., code-mixing at vocabulary and phrase levels).

4.2.2 Cross-lingual dimension of L1 and L2 communicative proficiency

Pearson and partial correlations between English and Japanese factor scores revealed the strong correlation, $r = 0.51$ ($p < .001$), between English conversational style and general Japanese competency. These factors are loaded on conversational richness, picture sequence richness and ease in speaking both languages. The present correlations appear to indicate that interactional style is interdependent across languages. In other words, a child who tends to volunteer information and provide detailed elaborate responses to questions in Japanese will tend to manifest the same types of interactional behavior in English. The findings of the regression analyses further suggest that L2 interactional style is affected by personal attributes (i.e., personality) that individuals bring to the task of acquiring L2. Personality and L2 interactional style appear to play a major role in determining the ways in which learners tend to interact in L2. In contrast, LOR or the amount of exposure to L2 appears to be a much more important factor in the acquisition of L2 syntax. Thus, it may be proposed that L1 and L2 interactional style are interdependent as a result of the fact that both are, to a significant extent, manifestations of personality attributes of the individual. Similarly, L1 and L2 cognitive/academic proficiency are interdependent, it is hypothesized, as a result of the fact that both are, to a significant extent, manifestations of the same underlying cognitive proficiency. Synthesizing all these analyses, Cummins et al. (1984:74) concluded that the results were consistent with the interdependence principle, namely, that development of L2 cognitive/academic (context-reduced) proficiency is partially a function of level of L1 cognitive/academic proficiency at the time intensive exposure to L2 begins. He continued his comment on the generalizability of transfer, saying that despite the vast difference in subjects (Japanese upper-class versus Finnish working-class) and contexts, this pattern of results is precisely the same as that reported by Skutnabb-Kangas and Toukomaa (1976), namely level of L1 proficiency on arrival is important both for acquisition of L2 academic proficiency and for continued development of L1 academic proficiency.

In the following section, cross-lingual dimension of oral proficiency are further examined with Portuguese-speaking children enrolled in public schools in Japan.

5 Study II: Cross-lingual dimension of Portuguese and Japanese oral proficiency

Nakajima (2001a) investigated the cross-lingual relationship of oral proficiency between Portuguese (L1) and Japanese (L2) among Portuguese-speaking children of foreign workers, grade 1 to 9, enrolled in public schools in Japan, group (iii) children in Section 3. The data were collected during 1998–1999 as part of a large-scale study of the National Japanese Language Institute (renamed the National Institute for Japanese Language and Linguistics, NINJAL, in 2008), which was the first comprehensive investigation of the bilingual development of oral, listening and reading skills among the JLL (Japanese language learners) children from Brazil, Peru, China, and Vietnam.

The total number of children involved was 1,672 from eight prefectures, but the oral interview was given only to 240 students. Their average length of residence, LOR, was 3 years and 4 months, and the average age of arrival, AOA, was 6 years and 2 months. Among 240 children, 51.5% were enrolled in various forms of Japanese as a second language (JSL) program, but the rest were left in a submersion situation with no adequate JSL assistance. With regard to L1 maintenance, there was, at the time, no formal heritage language program instituted in Japan: only a few had private lessons after school or in the home (e.g., 2–3 hours a month).

5.1 Data collection and analysis

The test instrument used for this study was the Oral Proficiency Assessment for Bilingual Children (OBC), which was originally developed for heritage language learners by the Canadian Association for Japanese Language Education in Canada (CAJLE 2000). OBC consists of two sets of tasks: communicative and academic/cognitive. The communicative task set consists of role plays to see if the child is able to initiate and lead conversations in situations such as taking a phone message or inquiring about the opening time and admission fee of a community swimming pool. The academic task set consists of tasks that require the child to manipulate the discourse level in speaking, e.g., to tell a folktale or the child's experience of an earthquake, to explain global warming in simple terms, or to describe the digestive mechanism of the human body. Picture cards are consistently used as prompts. A parental questionnaire of 31 items were administered to collect varied information on the oral and literacy environment in the home, and parental attitudes toward the child's acquisition of Japanese and the maintenance of their L1. These variables were used in multiple regression analyses as predictors of Japanese and Portuguese oral proficiencies.

5.2 Findings

5.2.1 Cross-lingual dimension of L1 and L2 oral proficiency

Despite the linguistic dissimilarity of Japanese and Portuguese, a moderate but statistically significant correlation was observed between the two languages when LOR and AOA were controlled. Academic task scores were related across languages for eight of twelve measures (e.g., richness of content, coherence, vocabulary) with r ranging from .146 to .261 ($p < .005$). Correlations for communicative task scores were also significant across languages in four of twelve measures (e.g., fluency, speech style, attitude) r ranging from 0.133 to 0.258 ($p = .002$). Similar relationships were observed between Portuguese communicative scores and Japanese academic scores, $r = .261$ ($p < .005$), the most robust relationship. All these results indicate that Portuguese and Japanese oral proficiencies, although these two languages are vastly dissimilar, interact, in a statistical sense, with each other across the two languages, not only within each language, but also between the two different dimensions, communicative and academic. In other words, a child who tends to volunteer information and provide detailed elaborate responses to questions in Portuguese will tend to manifest the same types of linguistic behavior in Japanese, though the nature of the causal linkage, and its direction(s), is not determinable on the present evidence. The fact that Portuguese academic scores were not correlated with Japanese academic scores can be explained by the fact that academic aspects of Portuguese were not maintained at an adequate level in the home or outside.

5.2.2 Predictors of L2 oral proficiency

Stepwise regression analysis was performed with various test scores as dependent variables. The results revealed both cross-lingual and cross-dimensional relationships. Approximately 47% of Japanese communicative task scores were accounted for by Portuguese communicative and academic scores, together with two other variables, the level of L2 desired by the parents and the child's use of home language. Likewise, approximately 61% of Japanese academic task scores was accounted for by Portuguese quality measures, together with four other variables: the parents' level of Japanese proficiency, the level of L2 desired by the parents, the child's exposure to L2 books, and the child's exposure to L2 TV programs. Similarly, in the regression of L2 Stage, L1 academic level and reading L1 books were two of six variables that accounted for 68% of their scores. It is an intriguing finding that reading L1 books, not L2 books, is positively related to L2 oral proficiency acquisition. This finding indicates that in second language acquisition, both communicative and academic dimensions of the child's first language, oral or written, have relevance in the development of L2 oral proficiency.

Besides language-related variables, two major types of predictors have come through in regression. The first is individual attributes, both the child and parental attributes. Among the child's attributes, the child's age appeared as the strongest predictor for all L2 measures, while the child's gender was related only to L1 academic measures. Being a girl appears to be an advantage in L1 quality maintenance. Among the parental attributes, parents' expectation of the child's L2 attainment turned out to be the strongest predictor; it came through with all L2 measures, both communicative and academic scores, while parents' L2 proficiency was related only to L2 academic scores.

With regard to input and output variables of the child's exposure to language, we found that input variables related to the academic dimension, whereas output variables related to the communicative dimension. Regarding input variables, the quality of a child's L2 was predicted through the child's reading books and watching TV. Regarding output variables, the child's choice to speak L2 with parents related negatively to all L1 measures, and related positively only to L2 communicative skills. These relations suggest that a child's use of L2 in the home will hinder overall L1 oral proficiency and will not help the child's academic proficiency in L2 either. Conversely, if a child uses L1 in the home, this might help tremendously in overall maintenance of the child's L1, without impeding the child's development of L2 academic oral proficiency.

These results indicate that the two oral proficiencies are interdependent across languages and also between the two dimensions. On the basis of this evidence, we may hypothesize that L1 and L2 communicative oral proficiencies are interdependent, with the child's interpersonal skills as a medium, while L1 and L2 academic oral proficiencies are interdependent, with discourse quality as a medium. These dynamic interactions, however, should be further investigated developmentally and also in connection with other contributing factors (e.g., school-related factors), which were not adequately included in this investigation. Nonetheless, all evidence points to the conclusion that promoting L1, especially L1 academic oral proficiency, through mechanisms that remain to be further investigated, would help promote both L2 acquisition and L1 maintenance.

6 Study III: Cross-lingual dimension of Portuguese and Japanese writing skills

Ikuta (2002) investigated cross-lingual transfer between Portuguese (L1) writing expertise and the development of Japanese (L2) writing skills among sixty-four Brazilian students ages 12–15 in the central part of Japan. Like the students in Study II, they were brought to Japan with their parents, who came not as immigrants but as temporary workers. Although there is no official immigration policy in Japan,

temporary workers were accepted from South American countries such as Brazil and Peru, if they could prove that they are descendants of Japanese emigrants. They all attended local public schools with some support of JSL, but the content of the support varied from school to school. Unfortunately, no assistance was given to the maintenance or the development of their first language, except for occasional help by visiting Portuguese-speaking support staff; such visits were quite sporadic, at most a few times a month. There were 16 high schools that participated in this study.

Specifically, Ikuta asked the following three questions: (1) How long does it take Portuguese students to acquire age appropriate L2 writing skills?, (2) To what extent do LOR and AOA affect L2 acquisition and L1 maintenance? and (3) What is the cross-lingual relationship between L1 and L2 writing? For comparison, 33 Japanese students, born and raised in the same area, and 10 Brazilian students in Sao Paulo, Brazil, were involved as experimental groups.

6.1 Data collection and analysis

The data were collected in 1999–2000. The participants were asked to write bilingual compositions in the school with the same prompt: “Which do you prefer, country life or city life? Why? Explain the reasons in detail.” The choice of the language and its order were left to the student. The time allotted for both Portuguese and Japanese compositions varies from student to student from 10 to 50 minutes. The collected data were analyzed according to five categories: (1) fluency, (2) vocabulary variety, (3) sentence depth (the use of subordinate clauses), (4) number of errors, (5) organization and content. Categories (1), (2), (3), and (4) are considered as part of general language knowledge or discrete language skills (DLS) in Cummins’s terms, while the categories in (5), measuring writing expertise, are clearly part of academic language proficiency (ALP). Ikuta (2002) hypothesized that the categories in (5) would be interdependent across languages, while categories (1) to (4) would be language specific.

6.2 Findings

6.2.1 Cross-lingual dimension of L1 and L2 writing

As illustrated in Table 3, three categories, Fluency, Vocabulary Variety, and Organization and Content, were significantly correlated between Portuguese and Japanese when the scores were controlled for LOR or AOA. Among those three, the strongest correlation was observed, as predicted, in Organization and Content, the range was from $r = .62$ to $.67$ ($p < .01$). On the other hand, the categories that did not show significant correlations were Sentence Depth and Number of Errors. In other words, those who write with a variety of vocabulary in Portuguese tend to do the same

in Japanese, and those who write a composition with clarity of organization and rich content in Portuguese tend to produce a composition with similar qualities in Japanese as well. On the basis of these observations, Ikuta concluded, in support of the linguistic interdependence principle, that writing expertise consists of two aspects: those that are interdependent across Portuguese and Japanese, and those that are language-specific or independent from one another. Fluency, Vocabulary Variety, and Organization and Content are interdependent across languages, i.e., the manifestation of common underlying proficiency, while sentence depth and number of errors are language-specific, i.e., part of surface structure.

Table 3: Pearson and Partial Correlations between Portuguese and Japanese writing measures ($N = 55$)

	(1) Fluency	(2) Vocabulary Variety	(3) Sentence Depth	(4) Number of Errors	(5) Organization & Content
Pearson's r	.10	.00	-.06	-.23	.31
Partial correlations					
LOR controlled	.56**	.21*	-.08	-.15	.67**
AOA controlled	.35**	.25*	-.02	.11	.62**

** $p < .01$ (two-tailed), * $p < .05$ (two-tailed).

6.2.2 The effect of LOR and AOA on the development of L2 writing and the maintenance of L1 writing

Using five categories, Ikuta traced the process of acquiring age appropriate Japanese writing skills by Portuguese students, in comparison with Japanese peers in the experimental group. She found that in the three categories of Fluency, Sentence Depth, and Organization and Content, the students first approached the native level with statistical significance within three to four years of LOR. The next category in which the students reached native level was Vocabulary Variety, which took four to six years, and then Orthographical Errors, which took about six to ten years. Other Errors, grammatical or lexical, seemed to require much longer. Ikuta also noted that, after six years or so, Portuguese students tend to surpass Japanese peers in Organization and Content and Fluency, although there were individual differences. In contrast, AOA had dominant influence over L1 maintenance. Older arrivals tended to demonstrate faster development in Organization and Content, Accuracy, and Fluency, while younger arrivals appeared to be disadvantaged in the areas of Vocabulary Variety and number of Grammatical Errors. Interestingly, Sentence Depth, i.e., the average length of sentence or use of subordinate clauses, seemed not to be affected by AOA. Ikuta (2002) speculated that in the case of the children who

experience transnational change from an L1 to an L2 environment, L1 grammatical knowledge once acquired tends to be maintained even in an L2 environment, while vocabulary knowledge tends to be lost quickly, because it is more context-embedded.

7 Study IV: Cross-lingual dimension of Japanese and English writing and *kanji*-using skills

In this section, the cross-lingual relationship in writing among two dissimilar languages is further investigated with Japanese-speaking children in Toronto Hoshūkō, where L1 maintenance is vigorously promoted. Nakajima et al. (2012) have been investigating cross-lingual relationships between Japanese (L1) and English (L2) writing ability, with a focus on the use of *kanji* (logographic) characters in writing. This on-going study is being conducted with 336 Japanese speaking children grades 1-9 in Toronto Hoshūkō who are going through various developmental stages of writing from burgeoning to independent in both languages in Canada. Since English and Japanese differ distinctly in various aspects, from phonological, morpho-syntactic to orthographical structure, the study, based on its design, may shed light on the intra- and inter-lingual relationships between the two languages, alphabetic and non-alphabetic. The orthographic structure of Japanese can be described as a combination of syllabic *hiragana* and *katakana* and logographic *kanji* characters. Traditionally, school children in Japan are expected to acquire *hiragana* and *katakana* syllabic symbols that consist of 48 symbols each, during grade one, whereas the acquisition of approximately 2,000 basic *kanji* characters requires nine years from grade 1 to grade 9. Following the national curriculum, school children in Japan are expected to learn a prescribed number of specific, new *kanji* characters in each grade, 80 in grade 1, 160 in grade 2, 200 in grade 3, 200 in grade 4, 185 in grade 5, 181 in grade 6 and 939 in grade 7 to 9. Any formal writing without using *kanji* characters, that is, writing with only *hiragana* and *katakana* scripts, is considered inadequate, immature and unsophisticated.

Koda and Zehler (2008) have pointed out that, from a psycholinguistic perspective, writing is an act of mapping spoken language on to graphic symbols. Since writing is embedded both in a spoken language and the related writing system, its acquisition entails establishing a linkage between the two. The process of making such a linkage differs depending on (1) the type of orthographical structure of the language involved, (2) the similarity or dissimilarity or distance between two orthographical systems, and (3) the maturity of the school-age learner in the development of meta-linguistic awareness. More specifically, various aspects of metalinguistic awareness are involved in writing, such as grapho-phonological awareness (recognizing the relationship between graphic symbols and speech sounds), and grapho-morphological awareness (recognizing the relationship between graphic symbols and

morphological elements of spoken words). Since the acquisition of *kanji* characters requires specific grapho-morphological as well as grapho-phonological awareness distinctly different from English or *hiragana/katakana* syllabic symbols in Japanese, we are particularly interested in learning how *kanji*-using skills develop over time in the light of overall development of bilingual writing skills. This issue of development is particularly important because the subjects of this study are the children growing up in an alphabet-rich but *kanji*-free (or *kanji*-less) environment. Compared with those who grow up in a *kanji*-rich environment in Japan, it is a daunting task, and a challenge indeed, to acquire age-appropriate *kanji*-using skill for the learners as well as for the school, the teachers and the parents. Thus, the central questions of this study are these: (1) What aspects of the writing skills of Japanese and English bilingual school children are interdependent? (2) How do such L1 and L2 relationships differ depending on the child's age and bilingual type? and (3) How do such cross-lingual and language-specific aspects interact with *kanji* writing ability? We are particularly interested in investigating the role that *kanji*-using skill plays in the cross-lingual dimension of bilingual writing development.

7.1 Data collection and analysis

All participants from grade 1 to 9 attend local Canadian schools on weekdays and hoshūkō on Saturdays. In Canadian schools, English is the language of instruction, but some are enrolled in French immersion program where both French and English are used as instructional languages. Compared with the late 1990s when the first hoshūkō study (Study I) was conducted, parental backgrounds and home language use have changed drastically. Now, thirty percent of the participants were born in Canada with no foreseeable plan of returning to Japan, while in Study I, almost all were born in Japan and stayed only temporarily in Canada. In other words, the participants of this study are a mixture of groups (i) heritage language learners whose families plan to stay and (ii) the children of temporary residents. As for international marriage, thirty percent of the fathers of hoshūkō children are non-Japanese of various ethnic backgrounds, although most mothers are Japanese. The number of families of international marriage differs depending on grade: 35% in grades 1–5, 21% in grades 6–7, and 10% in grades 8–9. Furthermore, I found it particularly commendable that the school now provides an excellent print environment and carries out rigorous literacy promoting programs. For example, the hoshūkō now has a library containing more than 15,000 Japanese books, and school-wide voluntary reading is strongly encouraged through the library. In addition, annual school events include an Essay Presentation Day, where all students read their essays to their peers and parents. Also, participation in the National Annual Essay Contest organized by the Overseas Education Promotion Agency in

Japan has been vigorously encouraged, with the result that Toronto Hoshūkō was awarded a Best School Award for two consecutive years, 2009–2010 and 2010–2011.

During the school hours, the participants were asked to write two compositions on the same topic first in Japanese, and then in English (or French) with one-week intervals. The entire session was supervised by a homeroom teacher. The prompt for all grades was “Introduce Canada to someone who has never been here. Try to write as much as you can. You may include things about your school or things you do on weekends and holidays.” The time allotted for the task was forty minutes, but students were told to use the first five minutes for pre-writing so that they could organize ideas before beginning to write. Additionally, parents were asked to fill in a questionnaire about the child’s educational background, home language environment such as the language(s) used in father-child or mother-child interaction, frequency and type of reading and writing activities in each language in the home, and parental attitudes towards study at hoshūkō and at local Canadian schools.

The data were analyzed first qualitatively using the four-scale rubrics that we² developed, and then quantitatively in both languages (Sano et al. 2014). There were seven qualitative variables: Clarity of Theme, Organization, Cohesion, Audience Awareness, Rhetoric, Originality & Reflection, and Balanced Argument. Quantitative variables were eight: Fluency, Vocabulary Variety, Sentence Depth, Sentence Width, Conventional Errors, Grammatical Errors, Lexical Errors and Use of *kanji* characters. Correlational analysis was first performed with qualitative and quantitative measures. Then we conducted the same correlation analysis with different age groups and four bilingual types. Factor analysis was then performed with all the variables within and across language in order to examine how *kanji*-using skill relates to the internal construct of bilingual writing proficiency. Finally, we did stepwise regression analysis on individual and environmental variables as dependent variables.

7.2 Findings

7.2.1 Cross-lingual dimension of Japanese and English writing ability and the age factor

All the qualitative measures were significantly correlated across languages, while only three out of seven quantitative measures, Fluency, Vocabulary Variety, Sentence Depth were significant. Grammatical Errors, Lexical Errors and Sentence Width were language specific. Altogether, medium strength of correlation $r = .47$ to $.57$ ($p < .001$)

² The data was analyzed by a group of members, both researchers and practitioners, who were brought together specifically for this project. They are Yuko Ikuta of Chubu University, Aiko Sano of Hokkaido Bunkyo University, Tomoko Nakano of Brooklyn Japanese Language School and Misa Fukukawa of Barcelona Hoshuko in Italy.

was seen for Fluency, Organization, Originality/Reflection, Vocabulary Variety and Rhetoric. This indicates that those students who write fluently in Japanese with good organization, vocabulary and rhetoric tend to write English fluently with good organization, vocabulary and rhetoric. As observed in Studies I, II and III, LOR is a major factor for L2 development, while AOA is for L1 maintenance. Unexpectedly, however, instead of AOA, the child's biological age is found to be the most influential factor in both L1 maintenance and L2 development. This unusual phenomenon can be interpreted thus: Due to the strong L1 academic support by hoshūkō, all the students, irrespective of their AOA and LOR, are developing both English and Japanese writing expertise as they grow older and become mature cognitively and linguistically. Of course, if one takes a closer look at English writing skills, LOR is a major factor when it is short, but its effect disappears as the LOR goes beyond approximately 4 years.

How do such cross-lingual relationships differ depending on the child's age? Among the five age groups, 6–7, 8–9, 10–11, 12–13 and 14–15, Organization and Clarity of Theme are the two variables that consistently yield mild but consistent correlations at the significant level ($r = .34$ to 0.58 $p < .001$), and we observed that the older the child is, the higher the rate of correlation. This observation suggests that the ability, across the two languages, to present a theme clearly and to organize a composition in a coherent way becomes increasingly interdependent as the child grows older. In contrast, Fluency, Vocabulary Variety, and to a lesser extent Originality/Reflection show an opposite direction of change with respect to age: moderate correlations were seen at the significant level ($r = .30$ to $.59$ $p < .001$) in decreasing order. Thus it would appear that younger emergent writers in primary school tend to write a longer composition with a variety of vocabulary in both languages, but as children grow older, these aspects become less interdependent. A similar 'decreasing' trend was also observed with Conventional Errors: the r values being, respectively, $.52$ $p < .001$ (age 8–9), $.40$ $p < .01$ (age 10–11), and $.28$ $p < .05$ (12–13). The present result coincides with our observation that those who tend to make spelling errors in English have a tendency to make Conventional Errors in Japanese; this pattern suggests that bilingual children may share a mental attitude or strategy towards the conventional rules of the two languages.

7.2.2 Cross-lingual dimension of Japanese and English writing ability and four bilingual types

Since our sample contains various types of bilingual writing abilities, we attempted to determine how cross-lingual relationships differ depending on the types of bilinguality: (a) high in both languages (JHEH), (b) high in Japanese but low in English (JHEL), (c) low in Japanese and high in English (JLEH), and (d) low in both languages (JLEL). Correlations between Japanese and English writing measures differ

according to the four bilingual groups as illustrated in Table 4. The groups which have the greater number of statistically significant variables are (a), (b) and (c). Group (a) has eight variables, (b) eleven variables, (c) ten variables, and (d) has only three variables. These results suggest that the two writing skills in (a), (b) and (c) tend to be interdependent, although (d) low in both languages (JLL) seem to be developing independently.

Closer observation, however, revealed that (a) JHEH are competent enough to write two compositions on different topics independently. They seem to be able to pay adequate attention to culturally different audiences even though the general theme given is the same. The presence of this ability may imply that JHEH are not only bilingual but also bicultural. In sharp contrast, (d) JLEL seem to lack a strategy for making a connection between the two. This result supports the conclusion of Genesee et al. (2006) that successful ELL readers and writers use similar strategies in both languages, whereas less successful ELL readers and writers do not, apparently not capitalizing on the commonalities of literacy across languages. Another observation we made in Table 4 is that (c) JLEH has a high correlation in fluency and vocabulary variety, $r = .72 - .77$ ($p < .001$). This correlation may be interpreted as some sort of practice effect. Since the majority of the students in this group chose similar topics, the writing in Japanese in the previous week may have played the role of preparation or 'draft' for the good copy written in English in the following week; the latter, after revision and expansion, turned into a better and longer piece of writing with a good variety of vocabulary.

Table 4: Correlations between Japanese and English Measures and Four Bilingual Groups

	Pearson's <i>r</i>			
	(a) JHEH (<i>N</i> = 39)	(b) JHEL (<i>N</i> = 44)	(c) JLEH (<i>N</i> = 55)	(d) JLEL (<i>N</i> = 22)
Organization	.56***	.70***	.57***	.19
Originality & Reflection	.60***	.50**	.45**	.55**
Rhetoric	.27	.50**	.67***	.20
Clarity of Theme	.40*	.52***	.60***	.09
Audience Awareness	.63***	.47**	.40**	.33
Balanced Argument	.29	.36*	.30*	.29
Cohesion	.65***	.44**	.29*	.46*
Fluency	.56***	.44**	.77***	.31
Vocabulary Variety	.59***	.37*	.72***	.43*
Sentence Depth	.20	.25	.38**	.62**
Conventional Errors	.17	.20	.31*	-.10
Grammatical Errors	-.01	-.07	-.06	-.13
Lexical Errors	-.06	.26	.12	-.18
Sentence Width	-.08	-.05	-.09	-.05

*** $p < .001$, ** $p < .01$, * $p < .05$.

7.2.3 *Kanji* using ability and the construct of bilingual writing proficiency

The ability to use *kanji* characters in writing is commonly assessed as part of linguistic knowledge or knowledge of orthographic conventions (e.g., Sasaki and Hirose 1999; Tanaka et al. 2009). In our study we, too, first measured *kanji*-related skill as part of conventional error rates. However, it soon became clear that the ability to use *kanji* characters plays a major role in developing an age-appropriate level of written style or academic register in Japanese writing. So we reexamined the types and tokens of *kanji* characters actually used and included in our correlational analysis. As expected, we found that *kanji*-related measures have significant correlations with all of the qualitative aspects of Japanese writing: $r = .440 - .647$ (type) and $.417 - .662$ (token) ($p < .001$). They were also closely correlated with qualitative measures such as Fluency and Vocabulary Variety. That is, those who write a lengthy composition using a variety of vocabulary also tend to use *kanji* characters more (token), and to use a greater variety of *kanji* characters (type). In addition, we found that *kanji*-writing variables have significant correlations with various aspects of English writing as well, with both qualitative and quantitative measures, although the correlation rate is much weaker.

The factor analysis confirmed and clarified the role of *kanji*-using skill in the construct of common underlying proficiency of bilingual writing. It can be seen in Table 5 and Table 6 that when the *kanji* variables were entered, two factors in Table 5 emerged from Japanese writing and three factors from English writing. The pattern of loadings on Japanese factors suggests the labels Japanese general writing expertise for Factor 1 and Japanese vocabulary/fluency/*kanji* for Factor 2. In this analysis, seven of the nine variables have loadings of $r = .50$ or greater on Factor 1, and this factor appears to represent a dimension: general Japanese writing expertise. Factor 2 has high loadings only on Fluency, Vocabulary Variety and *Kanji* Type, which appear to represent general Japanese language proficiency. The three English factors in Table 6 can be labeled as English general writing expertise for Factor 1, *kanji*/conventional accuracy for Factor 2, and grammatical/lexical accuracy for Factor 3. These factors account for 64.7% (Japanese) and 63.1% (English) of the total variance.

It has been noted that *kanji*-using skill (in its various components) is an integral part of general Japanese writing expertise as well as part of general Japanese language proficiency. The relationship with English-writing skill is more limited; *kanji*-using skill is only related with English conventional accuracy. Obviously, children do not use *kanji* characters in their English writings, but indirectly *kanji* writing skill is related with how correctly and accurately they write in English. In other words, those students who do write *kanji* characters with accuracy tend to have fewer problems with English spellings and their conventional rules.

The results of the reexamination of cross-lingual dimension and the age factor, with *kanji*-related variables included, indicate three stages of bilingual writing development in connection with *kanji*-using skill. The first is an emergent stage for the

Table 5: Factor loadings for Writing Skills in Japanese with *Kanji* measures ($N = 242$)

	Factor 1	Factor 2
% of Variance	45.364	20.303
Rhetoric	.821	-.031
Originality & Reflection	.768	-.045
Audience Awareness	.763	.019
Organization	.758	.030
Clarity of Theme	.756	-.151
Cohesion	.749	.013
<i>Kanji</i> Token	.707	.196
Balanced Argument	.508	.020
Sentence Depth	-.221	.999
Vocabulary Variety	.001	.953
Fluency	.049	.946
<i>Kanji</i> Type	.244	.747

Table 6: Factor loadings for Writing Skills in English with *Kanji* Measures ($N = 242$)

	Factor 1	Factor 2	Factor 3
% of Variance	46.449	9.090	8.179
Vocabulary Variety	.976	-.207	-.080
Fluency	.914	-.020	-.038
Audience Awareness	.894	-.106	-.008
Rhetoric	.878	.081	.143
Cohesion	.820	.036	.040
Clarity of Theme	.819	-.010	.022
Originality & Reflection	.748	.173	.027
Organization	.732	.170	.106
Sentence Depth	.583	.014	-.062
Balanced Argument	.420	.141	-.164
<i>Kanji</i> Token	.068	.867	-.203
<i>Kanji</i> Type	.032	.735	-.100
Convention Accuracy	-.060	.625	.388
Lexical Accuracy	-.192	.029	.698
Grammar Accuracy	.185	-.132	.682

children under the age of seven or eight; the second, a formative stage for the children ages eight to ten; and the third, an enrichment stage for those ages eleven to fifteen. During the emergent stage, *kanji* variables show extremely strong correlation, $r = .773 - .921$ ($p < .01$) with Japanese Fluency and Vocabulary Variety, but no correlations with English writing. However, in the formative stage, *kanji* token and

kanji type are mildly but significantly correlated with both Japanese and English writings, especially with qualitative aspects such as Clarity of Theme, Organization, and Rhetoric. And when it comes to the enrichment stage, i.e., where the number of *kanji* characters reaches more than eight hundred, much stronger and broader relationships with various variables both in Japanese and English emerge, as illustrated in Tables 5 and 6. They include not only qualitative variables, such as Rhetoric and Originality/Reflection, but also quantitative variables, such as Fluency, Vocabulary Variety, Sentence Depth and Conventional Errors. These results corroborate the findings of Murakami and Tanaka (1997) that abstract concepts expressed by multiple *kanji* use, sentence width, and sentence depth as part of academic register, will develop around the upper grades of primary education and the usage rate of development will reach the top in grade 9.

8 Summary and pedagogical implications: Teaching for transfer

In this final section, I will first summarize the findings of the cross-lingual transfer or common-underlying proficiency among dissimilar languages, and then discuss a more recent dynamic approach to promoting transfer through program organization and instructional strategies. During the past three decades, cognitive transfer has been considered as something that occurs naturally and automatically over time, but the landscape has changed dramatically. The case has been strengthened for teaching for transfer; that it should be promoted vigorously in schools and in the home through the integrated bilingual instructional approach rather than the two separate instructional assumptions. In support of integrated bilingual strategies, I will conclude this chapter with the discussion of this new trend of thought on transfer and its pedagogical implications.

8.1 Summary of the findings

Careful examination of four studies revealed that even between two languages that are vastly different in grammatical and orthographical structures, statistically significant correlations emerge in a wide range of skill areas, such as speaking, reading, and writing, as well as between vocabulary and *kanji* characters. The chosen studies – and they are not atypical – all supported general conclusion that relationships tend to be somewhat smaller albeit still statistically significant in the case of languages that differ markedly in writing system. However, we cannot ignore the fact that all studies were basically correlational and cross-sectional, and therefore far from conclusive as to causality and its direction(s). Nonetheless, despite these obvious

limitations, a big picture or general trends were confirmed, which corroborate general statements such as “learning to read in the home language promotes reading achievement in the second language” or “if you learn something in one language – such as decoding, comprehension strategies, or a concept such as democracy – you either already know it (i.e., transfer it to) another language or can more easily learn it in another language” (Goldenberg 2008: 14–15).

In this connection, there are three issues that warrant attention. The first issue is the size of the data set. In the field of bilingual and multilingual education, minority language education in particular, we rarely come across a large scale data set that allows adequate and definitive statistical analysis. In this sense, Studies I, II and IV are exceptional. In a country where the number of newcomer children is still small, such as Japan, the conclusions that are drawn from large scale studies are invaluable. Especially when two languages are dissimilar, the realization of transfer or common underlying proficiency is perhaps counterintuitive, or at least not easily understood. Thus, the results or generalized conclusions of such studies can be a powerful tool to clear away misconceptions and promote deeper understanding of biliteral development among policy makers, school administrators, and instructors, as well as parents. Second, researchers, including Cummins and Genesee, have asserted that the presence of different writing systems is the major cause of weaker correlations. However, a close examination of the data revealed that correlation rates fluctuate according to a combination of various factors: the child’s age, degree of bilinguality or bilingual type, and whether or not the social and educational milieux promote L1 development and maintenance. In fact, our evidence is consistent with the tentative conclusion that the difference of writing systems appears to play only a minor role in the total picture. Third, although transfer has long been conceived as a fixed pattern that automatically happens over time, this ‘static’ view of transfer was not supported in our studies, especially Study IV. Rather, we found that the construct of common underlying proficiency changes as the child grows more mature and as various aspects of bilingual proficiencies develop. This dynamic view of transfer opens a new page in transfer studies in bilingual and multilingual education. This new perspective supports a proactive approach to transfer, which I, in accord with Cummins’ analysis, subscribe; the details of such an approach will be discussed in the following section.

8.2 Pedagogical implications: ‘Teaching for Transfer’

In Studies I, II and IV, I realized that the participants, who on the surface appear to be immersed in a bilingual milieu, actually lived in ‘two monolingual worlds’ that rarely met. In the case of hoshūkō students, for example, their Canadian teachers had little or no knowledge about what their students learn on Saturdays, while hoshūkō teachers were usually only concerned with the Japanese national curriculum and its implementation. The parental support also tended to be for the Japanese

program, due to the language barriers. Under such circumstances, it is only the children who are confronted with the bilingual reality and try to do their best to master the situation. Cummins (2008) underscored the importance of teachers and parents having a bilingual perspective in educating such students to promote cross-language transfer as follows: “When we free ourselves from exclusive reliance on monolingual instructional approaches, a wide variety of opportunities arise for teaching bilingual students by means of bilingual instructional strategies that acknowledge the reality of, and strongly promote, cross-language transfer.” (p. 65)

As an example of bilingual instructional strategies, Cummins (2005) referred to *identity texts*, which are the products of students’ creative work or performances. ESL students, in collaborating with L2 (English) or L1 (heritage language) speaking peers, creatively write *identity texts* in L1 and L2: “Students invest their identities in the creation of these texts which can be written, spoken, visual, musical, dramatic, or combinations in multimodal form. The identity text then holds a mirror up to students in which their identities are reflected back in a positive light.” (p. 12) As a result, they are enabled to express their identities through both languages and see themselves as bilinguals who can use two languages rather than just one. One of the grade 5 ESL students expressed the interplay and facilitation between two languages (quoted in Cummins 2008:14): “When I write in English, Urdu comes in my mind. When I read in English I say it in Urdu in my mind. When I read in Urdu I feel very comfortable because I can understand it.” This statement insightfully describes, despite her still limited English, what happens inside the students’ heads as they grapple with the learning of English. Evidently project-based activities such as *identity texts* encourage access to both L1 and L2 as resource for learning. Such a bilingual instructional approach highlights the possibility of the transfer of concepts and strategies across languages, compared with the monolingual instructional approach, which essentially denies students’ access to their L1.

A study involving direct instructional intervention to promote transfer from L1 (Japanese) to L2 (English) was conducted by Sano (2010). The study, which was carried out at Toronto Hoshūkō with ten grade 2–3 students, involved special intervention writing class over three weeks (5 class periods). The students wrote compositions on the same topic before and after the intervention class. One of the foci of the interventions was the use of metaphor. Sano observed that although there was no use of metaphor in pre-intervention stage, four students used metaphor in Japanese and two in English in post intervention stage such as ‘like a rocket,’ and ‘like going through the forest.’ Sano (2010) explained, “This was perhaps because the use of the expressions such as ‘like’ is not particularly linguistically hard ... and once the concept of metaphor is made clear to them, it is relatively easy for them to transfer that skill across language. This finding is significant in that it provides evidence for such transfer even across typologically different languages such as Japanese and English.” (p. 117)

In conclusion, this special type of active bilingual program is, in my view, a new line of investigation: such programs which promote linguistic and conceptual transfer, even between two dissimilar languages should be encouraged vigorously in the future. Further there should be continued efforts to identify the internal constructs of *common underlying proficiency* and *language specific domains*: Both clearly facilitate understanding of the development of academic language proficiency that all school-age children need to acquire both in majority and minority language environments.

References

- Bussinguer, Vivian and Junko Tanaka. 2010. Mainoritī jidō no bairiterashī sokutei no kokoromi: Hi-shūjūchiku ni kyojū suru zainichi Burajirujin jidō o taishō ni [Measuring minority students' bi-literacy: A study with Brazilian minority students in non-ghetto areas]. *Bogo, keishōgo, bairingarū kyōiku kenkyū* [Journal of Mother Tongue, Heritage Language and Bilingual Education Studies Association] 6. 23–41.
- Canadian Association for Japanese Language Education. 2000. *Oral proficiency assessment for bilingual children (OBC)*. Toronto, Ontario: Canadian Association for Japanese Language Education.
- Cohen, Bernard. 1980. *Language assessment umpire*. Miami, FL: Santillana.
- Cummins, Jim. 1979a. Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research* 49(2). 222–251.
- Cummins, Jim. 1979b. Cognitive/academic language proficiency, linguistic interdependence, the optimal age question and some other matters. *Working Papers in Bilingualism* 19. 197–205.
- Cummins, Jim. 1981. The role of primary language development in promoting educational success for language minority students. In California State Department of Education (ed.). *Schooling and language minority students: A theoretical framework*, 3–49. Los Angeles: Evaluating Dissemination and Assessment Center, California State University.
- Cummins, Jim. 1991. Interdependence of first- and second-language proficiency in bilingual children. In Ellen Bialystok (ed.). *Language processing in bilingual children*, 70–89. Cambridge, UK: Cambridge University Press.
- Cummins, Jim. 2000. *Language, power and pedagogy: Bilingual children in the crossfire*. Clevedon, UK: Multilingual Matters.
- Cummins, Jim. 2001. *Negotiating identities: Education for empowerment in a diverse society*, 2nd edn. Los Angeles: California Association for Bilingual Education.
- Cummins, Jim. 2005. Teaching for cross-language transfer in dual language education: Possibilities and pitfalls. TESOL Symposium on Dual Language Education: Teaching and Learning Two Languages in the EFL Setting. Bogazici University, Istanbul, Turkey, 23 September.
- Cummins, Jim. 2008. Teaching for transfer: challenging the two solitude assumption in bilingual education. In Jim Cummins and Nancy H. Hornberger (eds.). *Encyclopedia of Language and Education*, 2nd edn., vol. 5: Bilingual education. 65–75. New York: Springer.
- Cummins, Jim. 2011. A dialogue between theory and practice: The education of deaf and hard-of-hearing students. In Kazuko Nakajima (ed.). *Gengo mainoritī o sasaeru kyōiku* [Promoting academic achievement among minority language students], 153–195. Tokyo: Keio University Press.
- Cummins, Jim and Kazuko Nakajima. 1985. Toronto Hoshūkō shōgakusei no nigengo nōryoku no kōzō [Construct of bilingual proficiency among primary school children in Toronto Supplementary Studies School in Toronto] In Gakugei Daigaku Kaigai Shijo Kyōiku Sentā (ed.). *Bairingarū/baikaruchuraru kyōiku no genjō to kadai* [States of the Art and Issues in Bilingual and Bicultural Education], 143–179. Tokyo: Tokyo Gakugei University.

- Cummins, Jim and Kazuko Nakajima. 1987. Age of arrival, length of residence, and interdependence of literacy skills among Japanese immigrant students. In Brigit Harley, Patrik Allen, Jim Cummins and Merrill Swain (eds.). *The development of bilingual proficiency*, Vol. III: Social context and age, Final report submitted to the Social Sciences and Humanities Research Council, 193–202. Toronto: Ontario Institute for Studies in Education.
- Cummins, Jim, Merrill Swain, Kazuko Nakajima, Jean Handscombe, Dana Green, and Chau Tran. 1984. Linguistic interdependence among Japanese and Vietnamese immigrant students. In Charlene Rivera (ed.). *Communicative competence approaches to language proficiency assessment: Research and applications*, 60–81. Clevedon, UK: Multilingual Matters.
- Fitzgerald, Jill and Jim Cummins. 1999. Bridging disciplines to critique a national research agenda for language-minority children's schooling. *Reading Research Quarterly* 34(3). 378–390.
- Genesee, Fred, Kathryn Lindholm-Leary, William M. Saunders and Donna Christian. 2006. *Educating English language learners: A synthesis of research evidence*. Cambridge, UK: Cambridge University Press.
- Goldenberg, Claude. 2008. Teaching English Language Learners: What the research – does and does not – say. *American Educator*, Summer 2008. 8–44.
- Ikuta Yuko. 2002. *Zainichi Burajirujin chūgakusei no sakubun nōryoku ni okeru bairingarizumu ni kansuru jissōteki kenkyū* [An empirical study on bilingual writing expertise among Brazilian students G7-9 in Japan]. Nagoya: Nagoya University dissertation.
- Kataoka, Hiroko, Yasuko Koshiyama and Setsue Shibata. 2005. Amerika ni okeru hoshūkō no jidōseito no nihongoryoku oyobi eigoryoku no shūtoku jōkyō [The acquisition of Japanese and English proficiency among *hoshūkō* students in the United States]. *Journal of Research in International Education* 2. 1–19.
- Koda, Keiko. 1994. Second language reading research: Problems and possibilities. *Applied Psycholinguistics* 15(1). 1–28.
- Koda, Keiko and Annette M. Zehler (eds.). 2008. *Learning to read across languages: Cross-linguistic relationships in first- and second-language literacy development*. New York: Routledge.
- MacGinitie, Water. & MacGinitie, Ruth. 1979. *Gates-MacGinitie Grade 2 Vocabulary and Reading Test Level B Form 2*. Toronto: Nelson Education.
- Menéndez, Bruno. 2010. Cross-modal bilingualism: language contact as evidence of linguistic transfer in sign bilingual education. *International Journal of Bilingual and Bilingualism* 13(2). 175–186.
- Minami, Masahiko. 2003. Holding on to a native tongue: Retaining bilingualism for school-age children of Japanese heritage. *International Journal of Educational Policy, Research and Practice* 4(2). 39–61.
- Murakami, Hiroyuki and Miyako Tanaka. 1997. Dōdai sakubun ni okeru kango hyōgen no hattatsu [The development of *kango* expressions in the writing samples on the same topic]. In Kazuhiko Nagatomo (ed.). A study of the developmental process of writing skills among school-age children, students and ESL learners. Final report. Grants-in-aid for scientific research. No. 06451155, Ministry of Education. 1–22.
- Nakajima, Kazuko. 2001a. The construct of L1 and L2 oral proficiency among Portuguese-speaking children in Japan. Proceedings of the third annual conference of the Japanese Society of Language Sciences. 25–32.
- Nakajima, Kazuko. 2001b. Bairingaruru ikusei to nigengo sōgo izonsei [Linguistic interdependency and bilingual education]. *Journal of Acquisition of Japanese as a Second Language* 8. 135–165.
- Nakajima, Kazuko, Misa Fukukawa, Tomoko Nakano, Aiko Sano, and Yuko Ikuta. 2012. The construct of L1 (heritage Japanese) and L2 (English) writing skills among Japanese-speaking children in Toronto. Poster presented at the International Conference on Heritage Languages and Heritage Language Acquisition. Victoria College, University of Toronto. 26–27 October.

- Peel, Elizabeth and Warren E. Lambert. 1962. The relation of bilingualism to intelligence. *Psychological Monographs* 76. 1–23.
- Prinz, Phillip and Michael Strong. 1998. ASL proficiency and English literacy within a bilingual deaf education model of instruction. *Topics in Language Disorders* 18(4). 47–60.
- Sano, Aiko. 2010. Building a bridge: A case study of teaching for transfer of writing skills among Japanese-English bilingual students. Toronto: Ontario Institute for Studies in Education of University of Toronto master's thesis.
- Sano, Aiko, Kazuko Nakajima, Yuko Ikuta, Haidee Thomson, Tomoko Nakano, Misa Fukukawa. 2014. Writing abilities of grade 1–9 Japanese-English bilinguals: Linguistic interdependency and AGE, LOR and AOA. *Journal of Mother Tongue, Heritage Language and Bilingual Education Studies* 6. 23–41.
- Sasaki, Miyuki and Keiko Hirose. 1999. Development of an analytic rating scale for Japanese L1 writing. *Language Testing* 16(4). 457–478.
- Tanaka, Mari, Sumi Nagasaka, Takahiro Narita, Hideaki Sugai. 2009. Dainigengo to shite no nihongo raitingu hyōka wākushoppu – hyōka kijun no kentō [Workshop for the assessment of writing skills in Japanese as a second language: evaluation scheme]. *Japanese as a Second Language from Global Perspective*. Vol. 19. 157–176.
- Tucker, Robert G. 1999. A global perspective on bilingualism and bilingual education. *ERIC Digest*. August 1999.
- Wright, Edgar Norman and Craig Ramsey. 1970. Students of non-Canadian origin: Age on arrival, academic achievement and ability. *Research Report #88*. Toronto: Toronto Board of Education.

III The teaching and learning of foreign languages

Kumiko Sakoda

5 Errors and learning strategies by learners of Japanese as a second language

1 Introduction

The purposes of this chapter include: (1) discussing learners' errors and (2) claiming that making errors is a learning strategy used by language learners. Analyzing learners' errors and correct usages helps us understand how their language systems and their rules operate and how they differ from the ones that teachers teach and from those of native speakers. In the 1960s and 1970s, error analysis, which attempted to classify the errors made by learners, flourished as a result of the criticism of contrastive analysis, which focused on the systematic comparison of a pair of languages for the purpose of identifying their structural differences and similarities. However, error analysis was also problematic for some reasons, and its heyday is long gone. However, it is obvious that no one can acquire a target language without making errors; even good language learners commit errors. Likewise, even the best teachers and the best method (if it exists) cannot go without learners producing errors.

Errors hold significant meaning for researchers and teachers. Error analysis in the 1960s and 1970s was problematic because of its methodological problems and scope limitations. This chapter affirms the correctness of the view that the learners' errors are worthy of study in their own right, not just as a degenerate form of the target system, by presenting two empirical acquisition studies of Japanese as a second language (L2). One is a study on acquisition of the demonstratives *KO*-, *SO*- and *A*-, whereas the other concerns the particles *NI* and *DE*. Analysis of three years of longitudinal spoken data revealed interlanguage, a dynamic linguistic system developed by an L2 learner who is approaching the target language but has not become fully proficient. Learners are developing their own language systems, including errors, and one of the characteristics is that they make chunks and their chunking reflects their own rules and systematicity, which represent learning strategies.

To begin with, 'errors' and 'learning strategies' need to be defined. According to Corder (1967), an 'error' is a deviation in learner language which results from lack of knowledge of the correct rule (Ellis 2008). Lennon's (1991) definition holds an error to be a linguistic form or combination of forms that, in the same context and under similar conditions of production, would, in all likelihood, not be produced by the speaker's native speaker counterparts. James (1998) defines an error as an instance of language that is unintentionally deviant and is not self-correctible by its author. This chapter tentatively adopts James' definition. However, to define the term 'errors' is quite problematic, which we will discuss later.

The notion of “learning strategies” differs among researchers. Oxford (1990) and O’Malley and Chamot (1990), for example, classified learning strategies into some groups, such as cognitive, meta-cognitive, social, memory-related, compensatory and affective strategies. According to Selinker (1972), fossilization, which refers to the loss of progress in L2 acquisition despite regular exposure to and interaction with the target language, is caused by five central processes, and a learning strategy is one of them. Selinker describes a strategy of L2 learning as a tendency on the part of learners to reduce the target language to a simpler system. Also, Ellis (2008: 970) states, “A learning strategy is a device or procedure used by learners to develop their interlanguage. Learning strategies account for how learners acquire and automatize L2 knowledge.” We adopt Ellis’s definition in this chapter.

The chapter is organized as follows: Section 2 illustrates a historical overview of error analysis both in English as a Second/Foreign Language (ESL/EFL) and Japanese as a Second/Foreign Language (JSL/JFL) studies. Section 3 discusses problems of error analysis by focusing on the definition of error analysis, the limitation of scope, and methodological and theoretical problems. Section 4 introduces two acquisition studies of JSL: a study of Japanese demonstratives *KO*-, *SO*- and *A*- and a study of Japanese particles *NI* and *DE*. Analyzing learners’ errors and correct use investigates learners’ developing Japanese language systems. Section 5 concludes the chapter and suggests that errors should not be regarded as signs of inhibition, but simply as an evidence of the learner’s strategies of learning, followed by a look at future directions in SLA research.

2 Overview of Error Analysis

This section illustrates an overview of error analysis in ESL/EFL and JSL/JFL studies. The section introduces some of the main findings of the studies.

2.1 Error analysis in ESL/EFL research: Historical trends

In the 1950s the audio-lingual approach to foreign language education was prevalent. In the heyday of the audio-lingual approach, it was thought that learning would be more difficult if the differences between the native and target language were great whereas it would be easier if the differences were small. These assumptions were based on the idea of contrastive analysis, which involves analyzing two languages for the purpose of observing where two languages differ and then using those differences as the basis for predicting errors and for developing foreign-language teaching curriculum. In other words, contrastive analysis, which shares its ideas with the behaviorist approach represented by Skinner (1957), is grounded on the assumption

that language is a set of habits: (1) the habits established in one's first language (L1) might help or facilitate second-language (L2) learning (i.e., positive transfer); but (2) they might interfere with L2 learning (i.e., negative transfer) and produce errors. However, the results from contrastive analysis were not always as had been expected. Instead, shared errors among learners of different first languages were found to be common.

By the early 1960s, Chomsky's (1957, 1959, 1965) formulation of an innate rule-governed system evolving toward the full adult grammar was received with enthusiasm by linguists and psychologists, and eventually by SLA researchers and foreign-language educators in the early 1970s. In the field of L1 acquisition, to begin with, Brown and Bellugi (1964) stressed the rule-governed nature of language acquisition as opposed to behaviorist theory, which holds that children's speech is not rule-governed but is shaped by external contingencies and reinforced by caretakers' approval. While acknowledging the significant influence of environmental or parental interactions (e.g., mothers modify their speech to their children by simplifying, repeating, and paraphrasing), Brown and Bellugi emphasized that the process of language acquisition could not be explained by the behaviorist stimulus-response-reinforcement system alone. Rather, these researchers believed that the child's ability to engage in inductive processing would aid language acquisition. They paid particular attention to inductive processes characterizing the child's acquisition of syntactic structures. In analyzing toddlers' language acquisition, Brown and Bellugi thus concluded that mother-child interaction, which is a cycle of imitations, reductions, and expansions, would help the child's inductive processing of the latent structure and rules of the target language. In other words, Brown and Bellugi suggest that the child's innate ability to formulate hypotheses about the rules underlying language might overshadow the importance of environmental factors. In this formulation, therefore, because language acquisition/learning is a developmental process that involves reorganization of knowledge, errors are considered a sign of progress (Davis, Ovando, and Minami 2013; Minami 2002, 2015; Minami and Ovando 2003).¹

The impact of the above-described L1 research on L2 research was immense. Researchers turned their attention to errors and collected learners' errors (Dulay and Burt 1972). Following Brown's (1973) L1 acquisition study, which reported remarkable similarity among his three subject children in the order in which fourteen functor/grammatical morphemes (e.g., present progressive *-ing*, plural *-s*) were acquired, Dulay and Burt (1974) conducted a series of L2 studies to examine the question of whether developmental sequences, regardless of the L1 or the L2, could be identified

¹ First and foremost, I would like to thank Masahiko Minami, the editor of *the Handbook of Japanese Applied Linguistics*, for his patience and understanding. I believe that Minami's suggestion that child language researchers have much to contribute to L2 language acquisition opens up many fruitful avenues for future research.

in terms of a common/invariant sequence of acquisition for functor morphemes in English. Replacing contrastive analysis, error analysis thus enjoyed considerable popularity in the late 1960s and 1970s. Consequently, many studies were conducted using error analysis (e.g., Corder 1967, 1971, 1981; Chamot 1978; Richards 1974).

Error analysis emphasized the importance of understanding errors made by learners. Corder (1967: 8) writes:

“We interpret his ‘incorrect’ utterances as being evidence that he is in the process of acquiring language and indeed, for those who attempt to describe his knowledge of the language at any point in its development, it is the ‘errors’ which provide the important evidence.”

Corder also points out that learners’ errors are important to the teacher. They inform the teacher as to what learners do and do not understand and allow for consideration of areas students are having difficulty in learning and areas where instruction has been insufficient. Also, they are important to the researcher as well. They inform the researcher as to learners’ problem areas and changes in errors lead to better explication of the process of acquisition.

During the heyday of error analysis, researchers were interested in description of errors, in other words, a linguistic classification of errors. Richards (1974) distinguished three types: interference (or interlingual) errors, intralingual errors, and developmental errors. Interference errors occur as a result of first-language transfer. Intralingual errors reflect overgeneralization, and developmental errors reflect learners’ hypothesis testing on the basis of limited experience. However, since both overgeneralization and developmental errors occur in the process of L1 acquisition, errors should be divided into two categories: interlingual errors and intralingual errors. Adding a third category to these, Dulay and Burt (1974) classified the errors into developmental errors, interference errors, and unique errors. Dulay and Burt’s developmental errors are similar to those observed in L1 acquisition, while unique errors are neither developmental nor interference errors.

However, errors that are categorized as developmental errors by some researchers may be classified as interference errors by others. Thus, classifying errors is difficult or even problematic because the observed errors are in many cases ambiguous. Furthermore, error analysis failed to provide a methodology to detect phenomena such as structural avoidance.

Further studies of grammatical morphemes also refuted the claims of Dulay and Burt (1974). From the perspective of error analysis, a number of researchers conducted morpheme studies based on error analysis in the 1970s (Dulay and Burt 1974; Bailey, Madden and Krashen 1974; Larsen-Freeman 1976). Those researchers claimed to have identified the acquisition order for a group of English morphemes, which include the articles (“a”, “the”), the copula and auxiliary “be”, and the noun and verb inflections such as person (first person, third person), number (singular,

plural), tense (regular past -ed and irregular past), and aspect (present progressive – *ing*). However, transfer from the native language modulates the acquisition order of grammatical morphemes and thus produces differences between learners of different language backgrounds. Thus, error analysis and morpheme studies lost their popularity as a result of their methodological weaknesses and limitations in the scope of error analysis (these problems will be discussed later in section 3).

2.2 Error analysis in JSL/JFL research

According to Corder (1981), two justifications were proposed for the study of learners' errors: the pedagogical justifications and the theoretical justification. Error analysis in JSL (Japanese as a second language) and JFL (Japanese as a foreign language) research that began in the 1970s can be divided into two approaches. One was an educational research approach examining how to teach while looking into the causes of errors (Miyazaki 1978). The other was a linguistic research approach using errors to examine Japanese grammar (Suzuki 1978). As for an educational research approach, learners' errors tell their teachers how far towards the goal the learners have progressed and what remains for them to learn. In this approach, teachers make teaching plans of what and how to teach learners by analyzing student errors.

As for a linguistic research approach, learners' errors inform researchers and linguists of grammatical constraints in the Japanese language, in other words, the reasons L2 output by students are incorrect. For example, a learner's error "*Shokudoo *de (ni) watasitati no iketa ikebana ga arimasu*" [The flowers we arranged is in the dining room. (Suzuki 1978: 12)] tells us the particle *DE* cannot be used to show the location of existence, instead particle *NI* should be used.

Let us here trace the history of L2 studies in Japan. Contrastive analysis was popular in Japan starting in the 1960s; in this analysis the errors were primarily considered to arise from the influence of the learner's native language, "native language interference". There were many research papers examining interference errors (Koo 1983; Morita 1985; Mizutani 1994). Studies published in *Nihongo Kyōiku* [The Journal of The Society for Teaching Japanese as a Foreign Language] from 1962 through 2013 were identified through a search of literature with a keyword 'errors', 'interlanguage', and 'acquisition' respectively. Table 1 summarizes those results. In the 1960s, there were no studies incorporating those keywords. Error analysis studies started in 1970s prior to those of 'interlanguage' and 'acquisition'. Studies of errors, which started in the 1970s, examined grammar, morphemes, and syntax of the Japanese language. Interlanguage studies, which followed those of 'errors', no longer appeared in the first decade of this century as the term faded and lost its popularity. In contrast, acquisition studies increased have explosively since the 1990s.

Table 1: Numbers of Studies in *Nihongo Kyōiku* (1962–2013)

keyword	'errors'	'interlanguage'	'acquisition'
1960s	0	0	0
1970s	7(7)	0	0
1980s	7(7)	2	3(1)
1990s	6(3)	6(4)	25(14)
2000~2013	6(4)	0	34(23)
Total	26(21)	8(4)	62(37)

() number of grammar, morpheme, and syntax acquisition studies

Some of the main findings of error analysis, in the field of ESL and JSL are summarized as follows (Taylor 1975; Ellis 2008; Sakoda 2002):

- (1) A large number of the errors are intralingual in origin rather than language transfer.
- (2) Learners at an elementary level produced more transfer errors than learners at an intermediate or advanced level, who produced more intralingual errors.
- (3) The proportion of transfer and intralingual errors varies in accordance with the task used to elicit samples of learner language.
- (4) Transfer errors are more common in the phonological and lexical levels of language than in the grammatical level.
- (5) The distance between L1 and target language could be one source for making errors.

3 Problems of error analysis

As described earlier, error analysis lost its popularity as a result of its methodological weaknesses. There have been a number of criticisms of error analysis (Schachter 1974; Schachter and Celce-Murcia 1977; James 1998; Ellis 2008), but this section focuses on the definition of error, and discusses problems of error analysis, such as limitations of scope and a comparative fallacy (Bley-Vroman 1983).

3.1 The definition of errors

The definition of errors was problematic to begin with. The difficulty also stems from the question of whether grammaticality or acceptability should serve as the criterion for errors (Ellis 2008). The utterances may be grammatically correct but are unnatural or contain inappropriate usages that make it difficult to determine whether

they are errors. In the case of example (1), the sentence would be judged grammatically correct, but speaking directly to a teacher who is in higher ranking, it would be wrong. “*kasite sasi-ageru*” [(I) lend (it) to you] cannot be used to someone higher ranking. It should be said naturally “*o-kasi suru*” [(I) lend (it) to you].

With regard to (2), from a pragmatic politeness point of view, one does not ask someone of a higher ranking if they do or do not want to eat; thus, the sentence would generally be considered wrong or unacceptable. If the question is about whether or not the learner can form and use the desiderative *~tai* construction, the form is correct, but if pragmatic politeness is part of the question, then the sentence counts as an error.

- (1) ?*Sensei, kono hon kasite sasiage masyoo ka.*

Teacher, this book lend give POL Q

(→ *sensei, kono hon okasi simasyoo ka.*)

‘Teacher, shall I lend you this book?’ (Matsuoka et. al 2000: 112)

- (2) ? (At a party) *Sensei wa nani ga tabetai desu ka*

teacher TOP what NOM eat.DESI COP Q

(→ *sensei, nani ka otori simasyoo ka*)

‘Shall I take something to eat, teacher?’ (Iranian speaker, Ichikawa 1997: 11)

Whether a given usage is an error or not may differ depending on the purpose of the research or the judgment of the researcher. As for example (1), it may be grammatical from the view point of a linguist who is interested in the selection of the Japanese verbs, giving and receiving, *kureru* ‘give’, *ageru* ‘give’ and *morau* ‘receive’. However, it will be considered wrong or unacceptable from the viewpoint of a sociolinguist who is interested in politeness. The same applies to example (2); it may be grammatical for the verb conjugation *tabe-tai* ‘want to eat’ from *tabe-ru* ‘to eat’, however, it will be unnatural or even unacceptable for a sociolinguist who is interested in pragmatics and politeness. As shown above, it is quite difficult to determine a given usage is an error or not.

A study conducted by Hughes and Lascaratou (1982) illustrates what is described above. They asked 30 individuals – 10 Greek native-speaking teachers of English, 10 English native-speaking teachers of English, and 10 native-speaking non-teachers – to judge whether sentences contained errors or were error-free. One of the error-free test sentences was judged to be erroneous by two for the Greek teachers, by three of the English NS teachers, and by no less than five of non-teachers. As can be seen here, it seems virtually impossible to obtain total agreement in error detection, and thus describing error definition is very problematic.

3.2 Limitation of scope: structural avoidance

The second problem is the limitation of scope, particularly structural avoidance. Schachter (1974) conducted an analysis of the relative clause errors produced by native speakers of Arabic, Chinese, Japanese, and Persian who were college students learning English and writing compositions in English. Note that Arabic and Persian have relative pronouns whereas Chinese and Japanese do not. Schachter investigated the number of correct relative clauses, the number of relative clause errors, the total number of uses, and the percentage of errors. Since neither Japanese nor Chinese has relative pronouns, it would be expected from the viewpoint of L1 transfer that acquisition of relative clauses would be difficult for both Japanese and Chinese learners. The percentages of errors were 25% for Persian speakers, 20% for Arabic speakers, 12% for Chinese speakers, and 8% for Japanese speakers. The percentage of errors was highest for college students who were speakers of languages having relative pronouns, contrary to expectation. However, when the total number of uses and correct uses are compared, it was clear that Japanese and Chinese speakers used only half as many relative clauses as Persian and Arabic speakers. That is, Japanese and Chinese speakers avoided using relative clauses, thus lowering both the number and percentage of errors. Schachter (1974) showed, then, that learners may resort to avoidance if they find a structure difficult. Error analysis focuses solely on what learners do but fails to shed light on the problem of avoidance. Error analysis, which focuses exclusively on what learners do, has no way of investigating avoidance and is seriously limited.

3.3 Methodological and theoretical problems

Error analysis also has methodological and theoretical problems. Bley-Vroman (1983) argues that work on the linguistic description of learners' language including errors can be seriously hindered or sidetracked by a concern with the target language. Bley-Vroman calls the concern "a comparative fallacy", which means the mistake of studying the systematic character of one language comparing it to another. Bley-Vroman claims that any study that classifies interlanguage data according to a target language scheme or that depends on the notion of obligatory context or binary choice will likely fail to illuminate the structure of the learners' language, interlanguage.

Noda et al. (2001) also pointed out the same methodological problems by illustrating the filling the blank test of Japanese particle *wa* and *ga*.

- (3) *Watasi (wa) Yamaguti-tyoo ni sundeimasu.*
 I TOP Yamaguti-town LOC live.PRG.POL.PRS
 'I live in Yamaguchi-cho.' (Noda et al. 2001: 128)

- (4) *Moosugu basu (?wa) kimasu.*
 Soon bus NOM come.POL.PRS
 ‘A bus is coming soon.’ (Noda et al. 2001: 128)
- (5) *Watasi (*wa) asondeiru toki, Yamada san wa benkyoositeimasita.*
 I NOM play.PRG when, Yamada san TOP study.PRG.POL.PST
 ‘When I was playing, Yamada san was studying.’ (Noda et al. 2001: 129)

If a learner puts the particle *wa* in all occasions of the test like example (3), (4) and (5), the learner’s accuracy of the particle *wa* is 100%, while the particle *ga* 0%. We cannot say the learner acquired the particle *wa* but not *ga*. Researchers usually make those elicitation tests, obligatory experiments and multiple choice tests based on target language rules. As for the case (5) above, some learners put *wa* instead of *ga* because they memorize *watasi wa* as a chunk. This might be one of learners’ own rules apart from what they learn in the classrooms. Bley-Vroman (1983:4) claims that the learners’ system is worthy of study in its own right, not just as a degenerate form of the target system.

4 Errors as a learning strategy

This section introduces two empirical acquisition studies of Japanese language. The studies investigate how learners establish their own rules different from those of Japanese using learning strategies. In this way, the section examines the learner’s own systems. The section further discusses the cognitive factors behind those strategies.

4.1 A learning strategy of demonstratives; *KO-*, *SO-* and *A-*

Sakoda (1994, 1998, 2002) collected learners’ spoken data for three years² and analyzed Japanese demonstratives; *KO-*, *SO-*, and *A-* including errors and correct use. Sakoda found that learners of JSL establish their own rules concerning *SONO* and *ANO* apart from what they learn in the classroom.

4.1.1 The system of the Japanese demonstratives

Japanese demonstratives have two major functions; one is deictic and the other anaphoric. The deictic demonstratives point out referents directly, while the anaphoric

² The National Institute for Japanese Language and Linguistics (NINJAL) maintains a corpus called C-JAS (Corpus of Japanese As a Second language). <https://ninjal-sakoda.sakura.ne.jp/laj/>

demonstratives are used in the discourse. In anaphoric use, *A*-series are used to indicate that the speaker thinks that the referent (i.e., hearer) shares the experience or mutual knowledge, while *SO*-series are used to indicate that the speaker thinks that the referent does not share the experience or mutual knowledge. Table 2 displays the demonstrative systems of Japanese, Korean, Chinese and English, showing that Japanese and Korean have three-term demonstrative systems, while Chinese and English have two-term ones.

Table 2: Demonstrative Systems of Japanese, Korean, Chinese, and English (Sakoda 1994: 166)

	Proximal	Medial	Distal
Japanese	<i>KO-</i>	<i>SO-</i>	<i>A-</i>
Korean	<i>I-</i>	<i>KU-</i>	<i>CE-</i>
Chinese	<i>ZHÈ</i> <i>NÁ</i>		
English	<i>THIS</i> <i>THAT</i>		

Chinese speaking learners of JSL produce errors using the *A*-series in place of the *SO*-series, as shown in (6). One might argue that these errors are attributable to the different systems of demonstratives. However, Korean speaking learners also make the same kinds of errors, as shown in (7). This type of error frequency is highest compared to others (Sakoda 1998). Thus, the error described here cannot be accounted for within the framework of contrastive analysis.

- (6) *Kinoo arubaito de atta kodomosan, *ANO(SONO) kodomo wa*
 Yesterday part-time job LOC met child that child TOP
totemo kawaii onnanoko desu.
 very cute girl COP
 ‘The small girl I met yesterday when I was doing a part-time job, was very cute.’
 (Sakoda 1998: 162, Chinese speaking learner)

- (7) (NS asked what the learner was surprised at when she came to Japan.)
Nihonjin no seikaku ka naa. Tomodati ga arun desu yo.
 Japanese.person GEN character Q SFP Friend NOM exist COP SFP
*Hiroshima de, demo, *ANO(SONO) hito wa ima, doosei sitan desu*
 Hiroshima LOC but that person TOP now live-together did COP
 ‘I wonder (this) may be attributable to the character of Japanese people.
 I have a friend in Hiroshima, and she lived together with a man.’
 (Sakoda 1998: 140, Korean speaking learner)

4.1.2 Literature review

Shin (1985) conducted an experiment using an elicitation fill in the blank test administered to 92 Korean students and claimed that they produced errors between *SO*-series and *A*-series. Shin concluded the results arose from the difference between their Korean L1 and Japanese L2. Sakai (1987) examined achievement tests of 99 students of Japanese with Korean, Chinese, and other language backgrounds. Sakai concluded that learners have difficulties distinguishing the differences between *SO*- and *A*-series and it is because of both (1) language transfer and (2) the lack of understanding of the constraints of *A*-series (which can be used only for speaker-hearer shared experiences or mutual knowledge). Niimura (1992) examined the usages of English speaking students mainly by a fill in the blank test. The results show difficulty of the use of *SO*- and *A*- as found by other researchers. Previous studies tended to use the method of multiple-choice tests without observing the learners' data. In those cases, the researchers made the questionnaires and used categories based on the target language norms. Unfortunately, such research practices fell into the comparative fallacy (Bley-Vroman 1983) of relating the L2 learner to the native speaker. Though the result of each study is identical showing the difficulty between *SO*-series and *A*-series in spite of different native languages, each study concluded that this was because of learners' L1 transfer.

4.1.3 Method

Sakoda (1998) examined free conversation data of 3 Korean (K1–K3) and 3 Chinese speaking learners (C1–C3) over three years based on 8 interviews of about 60 minutes each time. The learners started learning Japanese at the same language school in Japan. After 1 year, 5 of them advanced to universities and one Korean (speaker K1) went to another school and all of them kept studying Japanese. Conversation started on the same topic among all the learners and different topic each time. All data was transcribed and Japanese demonstratives *KO*-, *SO*- and *A*- were extracted with following nouns.

4.1.4 Results

Table 3 shows a Korean speaker's (K1) type of demonstrative use (errors are underlined). The learners' variable outputs are conditioned by the semantic features of noun phrases that co-occur with the demonstratives.

Table 3: K1's use of *SO-* and *A-* following the types of nouns (Sakoda 2001: 20)

noun	period	1	2	3	4	5	6	7	8
<i>hito</i> [person]			<u>ano</u>	<u>ano</u>	<u>ano</u> <i>sono</i>	<i>ano/sono</i> <i>sonna</i>	<u>ano</u> <i>sonna</i>	<u>ano/sono</u> <i>sonna</i>	<u>ano</u> <i>anna</i>
<i>sensei</i> [teacher] <i>gakusei</i> [student]					<u>ano</u>		<u>ano</u>	<u>ano</u>	
<i>onna</i> [woman] <i>otoko</i> [man]				<u>ano</u>	<u>ano</u>				
<i>gakkoo</i> [school] <i>daigaku</i> [university]					<i>ano</i>	<u>ano</u>		<i>sono</i>	
<i>mise</i> [shop] <i>kaisyu</i> [company]						<u>ano</u>		<u>ano</u>	<u>anna</u> <i>sono</i>
<i>koto</i> [matter]				<i>sono</i> <i>sonna</i>	<i>sono</i> <i>sonna</i>	<i>sonna</i>	<i>sonna</i> <i>anna</i>	<i>sonna</i>	<i>sonna</i>
<i>ki/kimochi</i> [intention]				<i>sonna</i>	<i>sono</i> <i>sonna</i>	<i>sono</i> <i>sonna</i>	<i>sonna</i>	<i>sonna</i>	
<i>kanzi</i> [feeling]					<i>sonna</i>	<i>sonna</i>	<i>sonna</i>		
<i>hanasi</i> [story] <i>kangae</i> [idea]				<i>sonna</i>	<u>sonna</u>	<i>sonna</i>	<i>ano</i>		<i>sonna</i>

Specifically, the learners are producing output on the basis of the following combinatorial patterns, in which the semantic features provide crucial environments for the selection of the two non-proximal demonstratives *SO-* and *A-*, showing (8).

(8) A learning strategy of *SO*-series and *A*-series demonstratives:

SO- + NP {-concrete} ex. *SO-nna+koto* [this matter], *SO-no+kimoti* [this feeling]

A- + NP {+concrete} ex. *A-no+hito* [that person], *A-nna+sensei* [that teacher]

Sakoda (1998) also conducted an experiment to test the hypothesis (8) using 20 Korean speakers, 20 Chinese speakers, and 20 native speakers of Japanese. A fill in the blank test was made with demonstratives *SO-* and *A-* showing shared knowledge and non-shared knowledge preceding concrete and abstract nouns as shown in (9) and (10).

(9) *Sutekina hito ga arawaretara, (*ano) hito to kekkon-suru.*
wonderful person NOM appear.COND, that person with marry-do
'If someone wonderful appears, (I) will marry him.' [Note: L2 learners have the tendency to attach *ano* (that) before *hito* (a person).]

- (10) *Sensyuu no kazi wa kowakatta ne. (*sonna) koto wa nidoto*
 Last week GEN fire TOP scary PST SFP, That matter TOP two.times
taiken-sitakunai ne.
 experience-do.want.NEG SFP
 ‘The fire last week was scary. (We) do not want to have that kind of experience anymore, don’t we?’ [Note: L2 learners have the tendency to attach *sono* (that) before *koto* (a thing).]

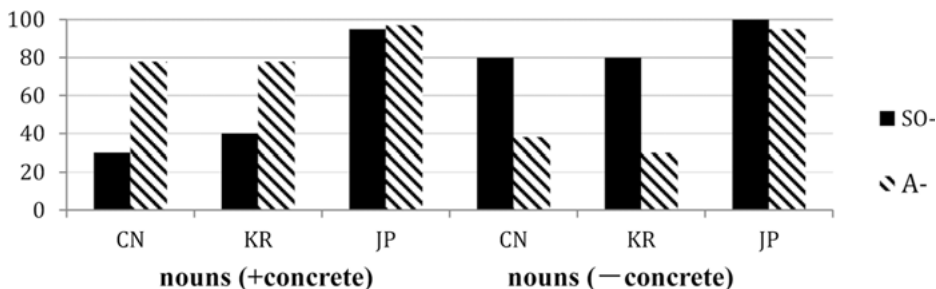


Figure 1: Accuracy rate by learners and NS

Figure 1 shows clearly learners select A-series demonstratives for (+concrete) nouns and SO-series for (-concrete) nouns, confirming the hypothesis (8). This indicates that learners have their own language system different from native speakers’.

4.1.5 Discussion

Sakoda (1998) analyzed errors by Korean and Chinese speakers and found that they produce the same type of A-series errors. Most of the previous studies used elicitation and fill in the blank tests based on target language categories and constraints and those studies may have introduced a comparative fallacy as Bley-Vroman claimed. It would be difficult to investigate a learner’s developing system with this approach.

Learners’ own usage of Japanese demonstratives shows that they are producing output on the basis of the combinatorial patterns with the semantic noun features. In other words, learners select A-series for nouns like *hito* ‘person’, *sensei* ‘teacher’, and *gakkoo* ‘school’ and they might make such chunks as *ano hito* ‘that person’, *ano sensei* ‘that teacher’, and *ano gakkoo* ‘that school’.

It is often said L2 learners acquire chunks and formulaic speech like greetings and classroom expressions. However, the results of this study indicate an underlying systematicity in learners’ use, including errors.

4.2 A learning strategy for NI and DE

In this section, another example, an acquisition study of Japanese locative particles *NI* and *DE* is introduced, in which it was found that learners use a strategy similar to the case of *KO*-, *SO*-, and *A*-. Error analysis of Japanese particles was very popular at the beginning of interlanguage studies since error frequency would be the highest compared to other grammatical items.

4.2.1 Literature review

When Japanese-language acquisition studies began in the 1970s, many researchers (Koo 1983; Morita 1985; Suzuki 1978) analyzed errors in particle use and used these to investigate Japanese grammatical constraints. In the 1980s and 1990s studies of the acquisition of Japanese particles were still in popular; Kubota (1994) analyzed longitudinal spoken data and Fukuma (1997) analyzed written data to investigate the acquisition process of particles *NI* and *DE*. Since the 1990s some researchers have gradually collected and analyzed longitudinal data to study the acquisition process.

Though there are many studies of Japanese particles, most of them are quantitative in orientation and describe which particles are more difficult to acquire than others. In most cases, they did not give an account for the results of the studies. Sakoda (2001) made a list of learners' error examples of *NI* and *DE* from previous studies to grasp the tendency of errors by JSL learners. Table 4 is a list of noun phrases including errors (●) and correct use (○) of *NI* and *DE*. In the table, A, B, and C indicate previous studies: A (Teramura 1990), B (Fukuma 1997), C (Ichikawa 1997) all give only examples of erroneous uses, while D (Sakoda 1998) has examples or both erroneous and correct uses.

From Table 4, it seems clear that learners of JSL produce errors using the particle *NI* with the nouns indicating relative positions; *usiro* 'behind', *naka* 'inside', *mae* 'in front of' and *tonari* 'next door, next to'. On the other hand, learners use *DE* with the nouns indicating places; *syokudoo* 'cafeteria', *inaka* 'countryside', *daigaku* 'university', and proper names of places.

4.2.2 Method

Sakoda (2001) formulated hypothesis (11) and conducted an experiment using 80 people: 20 Chinese speaking learners, 20 Korean, 20 other languages, and 20 native speakers of Japanese. They took a fill in the blank test of 49 questions including (12) and (13). If the hypothesis is correct, learners would be expected to (erroneously) fill in *NI* in (12) and *DE* in (13).

Table 4: Lists of noun phrases including errors and correct use of *NI* and *DE*

Noun phrases/Literature		A	B	C	D	Error examples
Error of <i>NI</i>	<i>Usiro ni</i> 'behind'	—	●	—	○	<i>Terebino ushiro ni mado desu.</i> (B) (A window is behind the TV.)
	<i>Naka ni</i> 'inside'	●	●	●	● ○	<i>Sono naka ni insyootekidatta ~</i> (C) (The impressive one in those~)
	<i>Mae ni</i> 'in front of'	●	—	●	—	<i>Tabakoyano mae ni au~</i> (C) (To meet at the front of the tobacco shop~)
	<i>Tonari ni</i> 'next to'	—	●	—	—	<i>~tonarini Piitaa san no heya desu.</i> (B) (The room next is Peter's.)
	<place> <i>ni</i> 'in place'	●	●	—	○	<i>Nepaaru niwa imamo 90% no zinkoowa noogyoo~</i> (B) (90% of the population is engaged in agriculture in Nepal ~)
	<i>Inaka ni</i> 'to suburb'	—	—	—	—	
	<i>Syokudoo ni</i> 'in cafeteria'	—	—	—	—	
	<i>Daigaku ni</i> 'in a university'	●	—	—	● ○	<i>Daigaku ni siken o ukete otimasita.</i> (D) (I took and failed the exam of a university.)
Error Of <i>DE</i>	<i>Usiro de</i> 'behind'	—	—	—	—	
	<i>Naka de</i> 'inside'	—	—	—	—	
	<i>Mae de</i> 'in front of'	—	—	—	—	
	<i>Tonari de</i> 'next to'	—	●	—	—	<i>Watasi wa ~no tonaride suwatte imasita.</i> (B) (I sat on next to ~)
	<place> <i>de</i> 'in place'	●	●	●	●	<i>Tookyoodo undeimasu.</i> (B) (I live in Tokyo.)
	<i>Tai de</i> 'in Thailand' <i>Inaka de</i> 'in suburb'	—	—	●	●	<i>Tai dewa byooin ga arunde kedo, inaka dewa arimasen.</i> (C) (There are hospitals in Thailand, but not in suburbs.)
	<i>Syokudoo de</i> 'in cafeteria'	—	—	●	○	<i>Syokudoode gohanwo tabeni ikimasu.</i> (C) (I go to a dining room to have lunch.)
	<i>Daigaku de</i> 'in a university'	●	●	●	—	<i>Heburai daigakude ryuugakusite, rainen~</i> (A) I studied at Hebrews Uni. and next year ~)

- (11) A learning strategy of Japanese particle *NI* and *DE* showing places:
Nouns indicating relative positions (i.e., *naka*, *mae* etc.) + *NI*
Nouns indicating PLACES, BUILDINGS (i.e., place names, *syokudoo* etc.) + *DE*

- (12) *Reizooko no naka (*ni) kinoo katta pan ga*
Refrigerator GEN inside in yesterday bought bread NOM
kataku natteiru.
hard become ASP
'The bread I bought yesterday turned hard in the refrigerator.'

- (13) *Gakusei kaikan (*de) amerika kara no gakusei ga*
Student center at the U.S. from GEN students NOM
10-nin tomarimasita.
10 stay PST
'10 students from the U.S. stayed in the Student Center.'

4.2.3 Results

As shown in Figure 2, in spite of their different native languages; Chinese, Korean and other languages, learners have the same tendency to select the particle *NI* for nouns showing relative locations and the particle *DE* for nouns of referring to places and buildings.

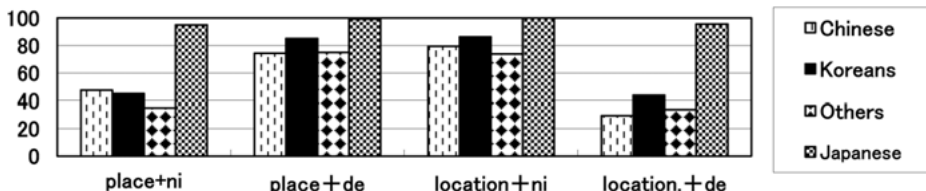


Figure 2: Accuracy rate of the particle use *NI* and *DE* by learners and NS

As a result, the hypothesis (11) was verified showing that learners of JSL use a learning strategy of chunking depending on the nouns before the particles *NI* and *DE* unlike native speakers.

4.2.4 Discussion

The results of the study of the choice of *NI* or *DE* strongly indicate that learners of JSL use a learning strategy and develop their learners' language system in which the selection of the particles depends on the nouns preceding them. Heubner (1979) also

reported that the article system of a Hmong-English interlanguage splits up reality in ways quite different from the English target. These experiments suggest that, as James (1998: 15) also points out, language systems are to be considered in their own right, on the basis of their own “internal logic”. In order to understand the learners’ language system and acquisition process, researchers should observe carefully not only their errors but also their correct use without measure their use against a target language norm. Otherwise the learners’ developing language system cannot be seen.

The learning strategy of *NI* and *DE* suggests that learners process chunks like *naka-ni* ‘inside’ and *syokudoo-de* ‘at a cafeteria’ before acquiring the target language norm. We find other error examples of chunking easily. For example, errors in the use of *~ga aru* ‘~NOM exist’, *~no hoo ga ii* ‘~GEN is better than’ and *~da to omou* ‘I think QUOT that ~’ such as those in (14) are commonly observed.

- (14) a. *Netu ga 37-do *ga(φ) arimasita.*
 Fever NOM 37-degree NOM exist. PST
 ‘(I) have a fever of 37 degrees.’
 (Sakoda 2002: 28, Chinese speaking learner, Elementary level)
- b. *Hayaku kaetta *no(φ) hoo ga ii desu.*
 Quickly return GEN way NOM better COP
 ‘(You) had better returning home quickly.’
 (Sakoda 2002: 28, Chinese speaking learner, Intermediate level)
- c. *Hontooni omosirokatta *da(φ) to omoimasu.*
 Really fun PST COP QUOT (I) think
 ‘(I) thought it was really fun.’
 (Sakoda 2002: 28, Indonesian speaking learner, Intermediate level)

4.3 Errors from the cognitive perspective

As seen above, learners formulate chunks at some stage of acquisition in spite of having different native language backgrounds. This section discusses why learners make chunks from the cognitive perspective and argues that interpreting and understanding learners’ errors requires more knowledge of and information from the cognitive perspective and psycholinguistics.

In psychology, chunking is the phenomenon of grouping together separate parts or items into a single larger unit. Ellis (2008: 479) wrote “Chunking (the process of storing formulaic sequences) provides a data base from which grammar can emerge through analogic processing.” Rosenbloom and Newell (1987) have proposed a theory in which chunking has even more importance as a learning mechanism and

in which it plays an important role in shedding light on the mechanism of the acquisition process.

For example, recalling a set of 12 alphabetic letters, such as “U L J A O I F A L N B S”, is quite difficult. If we change the order of the letters to form groups such as “ILO/USB/JFL/ANA”, we can recall them without difficulty since now each three-letter group has a meaning. In this case, we are remembering four three-letter acronyms rather than 12 separate letters. Because our working memory is limited, we make chunks. Chunking reduces our cognitive burden and conserves energy. Dividing the digits of a telephone number, say, 20151225, into 2 groups, 2015-1225 makes easier to recall. If we put a meaning on the number, for example, Christmas Day in 2015, then we could save even more energy.

Selecting between the particles *NI* and *DE* is difficult for learners of JSL/JFL even they learn the classroom grammatical explanation given by their teachers. It is much easier to use chunks since they do not have enough time to monitor their choices when they start speaking. Cognitive resources like working memory and attention are limited and therefore learners create their own strategies to save energy and effort (Schmidt 1992; Koyanagi 2001).

The next question that comes up in our minds is how learners make chunks, such combinations as “relative position nouns + *NI*” (i.e., *Naka-ni* ‘inside’), “place and buildings nouns + *DE*” (i.e., *Tokyo-de* ‘at Tokyo’). Noda et al. (2001) reported a high frequency rate for the combination “relative position nouns + *NI*” not only in spoken Japanese but also in textbooks used by L2 learners. It thus seems conceivable that L2 learners may easily draw on such frequency of occurrence in making noun+particle chunks.

5 Conclusion

This chapter has discussed learner errors and has advanced the claim that errors are not to be regarded as signs of inhibition, but simply as evidence of the learner’s learning strategies. Though error analysis in the past had many problems and is passed its heyday, the fact that learners develop their language system and acquire a target language through making errors has not changed. Analyzing both the errors that learners make and their correct uses provides us with critical information for understanding their language systems and their rules, which are still relatively unknown and full of mystery.

What has been emphasized throughout this chapter is that the learners’ system is worthy of study in its own right (Schmidt 1992). Analyzing L2 learner data from the learner’s viewpoint rather than analyzing them in accordance with the target language’s norms is important. Section 2 provided an overview of error analysis both in ESL and in JSL studies. Section 3 discussed problems of error analysis

by focusing on three points: the definition of error, the limitation of scope, and methodological and theoretical problems. Taking the problems discussed in Section 3 into consideration, Section 4 introduced two empirical studies of JSL with new approaches to error analysis. One of the two studies was a longitudinal study and was focused on the Japanese demonstrative morphemes *KO-*, *SO-* and *A-*. The other focused on the particles *NI* and *DE*. Analyzing both learners' errors and their correct usages, the studies demonstrated that learners created their own language rules, different from Japanese language norms. Additional experiments were conducted for verifying the hypotheses explaining learners' choices. The results were examined from a cognitive perspective, paying attention to the use of chunking.

Recently, error analysis has been re-evaluated, and studies of errors have been increasing in the field of English education. This renaissance is at least partly due to error analysis having been re-born to CEA (computer-aided error analysis). Developing computer techniques established a new academic field, corpus linguistics, and computers help us to collect learners' data and make large learners' corpora easily (Granger 1998, 2002). CEA can be expected to yield some answers to many questions in Japanese language acquisition. However, although CEA is very promising, we have to observe both errors and correct use carefully and the data should be analyzed from the learner's perspective rather from the target language norms, as mentioned earlier. The following issues are crucial for making error studies contribute to acquisition studies of Japanese and to Japanese pedagogy for the future:

1. After careful analysis of the data, a hypothesis should be proposed. Error studies are not for only collecting data, nor only analyzing quantitatively, nor labeling of categories based on linguists' analyses of the Japanese language. The researcher should analyze data not only from a quantitative perspective but also from a qualitative one. Furthermore, rather than examining research items alone, the researcher should pay attention to L2 learners' linguistic environments and discursive interactions.
2. After proposing a hypothesis, in order to test the validity of that hypothesis, experiments should be conducted. Finding whether the hypothesis is applicable to other learners makes the study an objective one.
3. As we have seen in Section 4.3, in accounting for the results, we should work together with researchers in other academic fields, such as psychology, cognitive science, and brain neurology.

According to a statistical survey conducted by the Japan Foundation in 2012, the population of learners of Japanese language totals 3,986,000 learners in 136 countries. They need good textbooks, useful dictionaries, and effective methods depending on their needs and native languages. Japanese is an agglutinative language and has several unique grammatical constraints compared to other foreign languages. Note that this chapter does not simply call for a return to contrastive analysis. Instead, the major point of the chapter is that L2 learners tend to build

the same chunks, to use the same strategies, and, thereby, make the same types of errors regardless of their native language. Analyzing the utterances produced by L2 learners whose languages are fairly different from Japanese, however, can provide a great opportunity not only to teachers and researchers of Japanese education but also to linguists working on typology and pragmatics, and even to those working on contrastive analysis.

Acknowledgment

This paper was supported by the Japan Society for the Promotion of Science (#24251010) to Kumiko Sakoda.

References

- Bailey, Nathalie, Carolyn Madden and Stephen Krashen. 1974. Is there a “natural sequence” in adult second language learning? *Language Learning* 21. 235–243.
- Bley-Vroman, Robert. 1983. The comparative fallacy in interlanguage studies: The case of systematicity. *Language Learning* 33. 1–17.
- Brown, Roger. 1973. *A first language: The early stages*. Cambridge, MA: Harvard University Press.
- Brown, Roger and Ursula Bellugi. 1964. Three processes in the child’s acquisition of syntax. *Harvard Educational Review* 34(2). 133–151.
- Chamot, Anna U. 1978. Grammatical problems in learning English as a third language. In Evelyn Hatch (ed.), *Second Language Acquisition*. Rowley, MA: Newbury House.
- Chomsky, Noam. 1957. *Syntactic structures*. The Hague: Mouton.
- Chomsky, Noam. 1959. A review of B. F. Skinner’s *Verbal behavior*. *Language* 35(1). 26–58.
- Chomsky, Noam. 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.
- Corder, Stephen P. 1967. The significance of learners’ errors. *International Review of Applied Linguistics* 5. 161–170.
- Corder, Stephen P. 1971. Idiosyncratic dialects and error analysis. *International Review of Applied Linguistics* 9. 149–159.
- Corder, Stephen P. 1981. *Error analysis and interlanguage*. Oxford: Oxford University Press.
- Davis, Kathryn. A., Carlos J. Ovando and Masahiko Minami. 2013. Language and literacy acquisition theories. In Beverly Irby, Genevieve H. Brown, Rafael Lara-Alecio and Shirley A. Jackson (eds.), *The handbook of educational theories*, 395–418. Charlotte, NC: Information Age Publishing.
- Dulay, Heidi C. and Mariana K. Burt. 1972. Goofing: An indicator of children’s second language strategies. *Language Learning* 22(2). 234–252.
- Dulay, Heidi C. and Mariana K. Burt. 1974. Natural sequences in child second language acquisition. *Language Learning* 24(1). 37–53.
- Ellis, Rod. 2008. *The study of second language acquisition. Second edition*. Oxford: Oxford University Press.
- Fukuma, Yasuko. 1997. Sakubun kara mita shokyū gakushūsha no kakujoshi ‘ni’ no goyō [Errors of case particle ‘ni’ in compositions by elementary level learners]. *Kyūshū daigaku ryūgakusei sentā kiyō* [Research bulletin, International Student Center, Kyushu University] 8. 61–74.
- Granger, Sylviane. (ed.), 1998. *Learner English on computer*. Harlow: Longman.

- Granger, Sylviane, Joseph Hung and Stephanie Petch-Tyson (eds.). 2002. *Computer learner corpora, second language acquisition, and foreign language teaching*. Amsterdam: John Benjamins.
- Heubner, Thorn. 1979. Order-of-acquisition vs. dynamic paradigm: a comparison of method in interlanguage research. *TESOL Quarterly* 13. 21–28.
- Hughes, Arthur and Chryssoula Lascaratou. 1982. Competing criteria for error gravity. *English Language Teaching Journal* 36(3). 175–182.
- Ichikawa, Yasuko. 1997. *Nihongo goyōrei shōjiten* [Small dictionary of Japanese language errors]. Tokyo: Bonjinsha.
- James, Carl. 1998. *Errors in language learning and use*. London: Longman.
- Koo, Hai-Gen. 1983. Chūgokujin-gakushūsha ni yoku mirareru goyōrei: Kakujoshi, kakarijoshi “*mo*”, setsuzokujoshi “*te*” nado o chūshin ni [On common errors made by Chinese learners of Japanese]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 49. 105–118.
- Koyanagi, Kaoru. 2001. Dainigengo-shūtoku ni okeru ninchi no yakuwari [The role of cognition in second language acquisition processes]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 109. 10–19.
- Kubota, Yoshiko. 1994. Dainigengo to shiteno Nihongo no jūdanteki shūtokukenkyū-kakujoshi “*wo*”, “*ni*”, “*de*”, “*e*” no shūtokuKatei ni tsuite- [Longitudinal acquisition research on Japanese as a second language-concerning the acquisition process of particles *o*, *ni*, *de* and *e*]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 82. 72–85.
- Larsen-Freeman, Diane. 1976. An explanation for the morpheme acquisition order of second language learning. *Language Learning* 26. 125–134.
- Lennon, Paul. 1991. Error: some problems of definition, identification and distinction. *Applied Linguistics* 12(2). 180–196.
- Matsuoka, Hiroshi. Isao Iori, Shino Takanashi, Kumiko Nakanishi and Toshihiro Yamada (eds.). 2000. *Shokyū o oshieru hito no tame no Nihongo bunnō handō bukku* [Handbook for people teaching learners of elementary level Japanese]. Tokyo: Suriē Nettowāku.
- Minami, Masahiko. 2002. *Culture-specific language styles: The development of oral narrative and literacy*. Clevedon, England: Multilingual Matters.
- Minami, Masahiko. 2015. Narrative development in L1 Japanese. In Mineharu Nakayama (ed.), *Handbook of Japanese psycholinguistics*, 181–215. Berlin: De Gruyter Mouton.
- Minami, Masahiko and Carlos J. Ovando. 2003. Language issues in multicultural contexts. In James A. Banks and Cherry A. McGee Banks (eds.), *Handbook of research on multicultural education*, 2nd edn., 567–588. San Francisco: Jossey-Baas.
- Miyazaki, Shigeko. 1978. Goyōrei o hinto ni kyōjuhō o kangaeru [Student errors and teaching method]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 34. 47–56.
- Mizutani, Nobuko. 1994. *Jitsurei de manabu goyōbunseki no hōhō* [Error analysis based on actual data]. Tokyo: ALC.
- Morita, Yoshiyuki. 1985. *Goyōbun no bunseki to kenkyū: Nihongogaku e-no teigen* [Study and analysis of Japanese language errors: Proposals to Japanese linguistics]. Tokyo: Kurosio Publishers.
- Niimura, Tomomi. 1992. Shijishi no shūtoku: nichieigo no shijishi no shūtoku no taishōkenkyū [Acquisition of demonstratives: A contrastive study for acquiring demonstratives by learners of Japanese and English]. *Waseda daigaku Nihongo kenkyū kyōiku sentā kiyō* [Bulletin of center for Japanese language, Waseda University] 4. 36–59.
- Noda, Hisashi, Kumiko Sakoda, Katsumi Shibuya and Noriko Kobayashi. 2001. *Nihongo gakushūsha no bunnōshūtoku* [Studies on grammar acquisition of learners of Japanese language]. Taishukan Shoten.
- O'Malley, Michael and Anna Chamot. 1990. *Learning strategies in second language acquisition*. Cambridge: Cambridge University Press.
- Richards, Jack. (ed.). 1974. *Error analysis*. London: Longman.

- Rosenbloom, Paul and Allen Newell. 1987. Learning by chunking: A production system model of practice. In David Klahr, Pat Langley and Robert Neches (eds.), *Production system models of learning and development*, 221–286. Cambridge, MA: MIT Press.
- Sakai, Takako. 1987. KO, SO, A no yōhō no kenkyū: Konpon gensoku no kyanseru jōken [A study on usages of Japanese demonstratives KO, SO and A: Cancel conditions of basic rules]. *Tsukuba Daigaku Ryūgakusei sentā Nihongo ronshū* [Tsukuba University Foreign Students Center Journal of Japanese language teaching] 2. 57–65.
- Sakoda, Kumiko. 1994. On the acquisition of Japanese demonstrative by Korean speakers. *Japanese/Korean Linguistics* 4. 165–181.
- Sakoda, Kumiko. 1998. *Chūkangengo kenkyū: Nihongo gakushūsha ni yoru shiji-shi KO-, SO-, A- no shūtoku kenkyū* [Interlanguage studies: A study on acquisition of demonstratives KO-, SO-, A- by learners of Japanese as a second language]. Hiroshima: Keisuishsha.
- Sakoda, Kumiko. 2001. Bogo no shūtoku to gaikokugo no shūtoku [Acquisition of mother tongue and the foreign language]. In Hisashi Noda, Kumiko Sakoda, Katsumi Shibuya and Noriko Kobayashi (eds.), *Nihongo gakushūsha no bunpōshūtoku* [Studies on grammar acquisition of learners of Japanese language], 195–212. Tokyo: Taishukan Shoten.
- Sakoda, Kumiko. 2002. *Nihongo kyōiku no tamenō dainigengo shūtoku kenkyū* [Studies on second language acquisition for Japanese language education]. Tokyo: ALC.
- Schachter, Jacquelyn. 1974. An error in error analysis. *Language Learning* 24(2). 205–214.
- Schachter, Jacquelyn and Marianne Celce-Murcia. 1977. Some reservations concerning error analysis. *TESOL Quarterly* 11. 141–151.
- Schmidt, Richard. 1992. Psychological mechanisms underlying second language fluency. *Studies in Second Language Acquisition* 14(4). 357–385.
- Selinker, Larry. 1972. Interlanguage, *International Review of Applied Linguistics* 10(3). 209–231.
- Shin, Hae Kyong. 1985. Dainigengo to shitenō Nihongo shūtoku ni okeru KO, SO, A no mondai [Problems of Japanese demonstratives, KO, SO and A by learners of Japanese as a second language]. *Gengo no sekai* [A world of languages] 2(2). 97–111. Tokyo: Sophia University.
- Skinner, Burrhus Frederic. 1957. *Verbal behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Suzuki, Shinobu. 1978. Kakujoishi o chūshin tosite [Centering on case particles]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 34. 1–14.
- Taylor, Barry. 1975. The use of overgeneralization and transfer learning strategies by elementary and intermediate students of ESL. *Language Learning* 25. 73–107.
- Teramura, Hideo. 1990. *Gaikokujin gakushūsha no goyōreishū* [Error examples by foreign learners of Japanese language]. Osaka University. Downloadable from <http://teramuradb.ninjal.ac.jp/>

Haruko Minegishi Cook

6 Adult L2 learners' acquisition of style shift: The *masu* and plain forms

1 Introduction

Japanese has two speech styles, the addressee honorific *masu* form and non-honorific plain form, and the ability to make appropriate shifts between the two forms is part of the speaker's "pragmatic competence"¹ (Taguchi 2009). How do L2 learners of Japanese acquire the pragmatic competence to appropriately shift speech style? This chapter reviews the literature of adult L2 learners' acquisition of style shift, examines learners' individual differences, and discusses issue for future research.

In Japanese, the sentence-final verb of the main clause ends either in the *masu* (a) or the plain form (b) as shown in Example (1)².

- (1) a. Taro ga Hanako to dekake-masu [*masu form*].
b. Taro ga Hanako to dekake-ru [*plain form*].
 Sub with go out
 'Taro goes out with Hanako.'

Examples (1a) and (1b) are identical in referential meaning but differ in social meaning. Typically, the *masu* form is referred to as the polite form or formal style, and the plain form, the informal style. In the case of subordination, the verb of the main clause can occur in either the *masu* form or the plain form; the verb in the subordinate clause usually remains in the plain form.³ In speaking Japanese, speakers must choose one of the forms appropriate to the current social context or to create a new social context. Japanese children acquire the pragmatic competence of style shift by age three (Clancy 1986a; Cook 1996a). In contrast to L1 children's trouble-free acquisition, for L2 learners of Japanese, the acquisition of style shift is not easy.

Multiple factors challenge L2 learners' acquisition of style shift. First, the difficulty comes from the fact that *masu* and plain forms are "indexes" (Silverstein 1976) or what Gumperz (1982) calls "contextualization cues". Among the three types

1 Taguchi (2009: 2) defines pragmatic competence as "the ability to convey and interpret meaning appropriately in a social situation".

2 "The plain form" discussed in this article is a *-u/ru* form of a verb.

3 In conversation, a *kara* ('because') or *kedo* ('but') clause can occur without the main clause. In this article, *kara* and *kedo* clauses occurring without the main clause are treated as an independent cause and the *masu* or plain form that occurs in such a clause is counted.

of signs of human language (i.e., icons, symbols, and indexes) (Peirce 1955), indexes are signs that are related to the things they stand for because they participate in or are actually part of the event they stand for. Indexes can only be interpreted within an actual context of use. In addition, the *masu* and plain forms are referred to as “non-referential indexes” (Silverstein 1976), for they “do not contribute to the referential speech event (e.g., Examples (1a) and (1b) above are identical with respect to referential meaning). Instead, they co-occur with a referential message and serve as a powerful tool for sense making in social interaction. Indexes point to or create social dimensions of speech such as the identity of the speaker, social situation, and social activity among others. Because the meanings of an index partially lie in the social context in which it occurs, an index always has multiple social meanings. Thus, the social meaning of an index is not constant but changes from context to context. To capture the fluid nature of indexical meaning, Ochs (1996) proposed a two-step model of indexicality, in which a linguistic feature is directly linked to a core meaning and this constant meaning (direct index) evokes a variety of situational meanings (indirect meanings). Drawing on Ochs’ model, I have proposed that the *masu* form directly indexes the self-presentational stance, which constructs a variety of social meaning in different social contexts (Cook 2008a). This fluidity of indexical meaning makes it extremely difficult for L2 learners to learn how to interpret and use indexes/contextualization cues. Japanese children’s easy acquisition of appropriate uses of indexes such as the *masu* form and sentence-final particles (Clancy 1986a) indicates that indexes are primarily learned in first language socialization and difficult to teach explicitly in a classroom. Gumperz (1996: 383) provides an explanation, noting that:

Because of the complexity of the inferential process involved and their inherent ambiguity, contextualization cues are not readily learned, and *certainly not through direct instruction*, so that ... second-language speakers may have good functional control of the grammar and lexicon of their new language but may contextualize their talk by relying on the rhetorical strategies of their first language. *Contextualization conventions are acquired through primary socialization in family or friendship circles* or intensive communicative co-operation in a finite range of institutionalized environments. [Italics are mine.]

As Gumperz indicates, it is difficult to teach appropriate speech styles in the classroom, for unlike grammatical rules, indexes cannot be taught by a rule-based model.

Second, the discrepancy between the explanation given in Japanese language textbooks and the indexical nature of the *masu* and plain forms complicates L2 learners’ acquisition of style shift. Because native speakers are generally unaware of a wide range of social meanings of an index (i.e., “limits of awareness” Silverstein 2001), even language instructors and textbooks are not able to explain how the *masu* and plain forms are actually used in different social contexts. Most beginning

Japanese language textbooks at the college level used in North America refer to the *masu* form as the 'polite form' or 'formal form' and explain that it should be used between or among people in a distant relationship or to show politeness to the addressee(s). The plain form is mentioned as a form to use between or among people who are in a close relationship, such as family members and good friends of the same age. However, as recent research on L1 Japanese style shift indicates, the *masu* form indexes a variety of social information – not only distant social relationship and polite attitude toward an older or higher-status addressee but also a range of social identities among others (e.g., Cook 1996a, 1996b, 2008a; Jones and Ono 2008; Okamoto 2011). Similarly, the plain form is not just a form to be used between people in a close relationship. The plain form without an affect key such as a sentence-final particle (i.e., naked plain form) indexes the speaker's detached stance (Cook 2008b; Maynard 1993). Furthermore, beginning Japanese language textbooks introduce the *masu* forms before the plain form (see Cook 2008a), and the majority of dialogues found in these textbooks are written in the *masu* form (Matsumoto and Okamoto 2003). This overemphasis on the *masu* form is partly due to the expectation that learners of a foreign language are expected to speak the target language 'correctly' and 'politely'.

It is not uncommon for speakers to change speech styles throughout the course of talk with the same addressee in the same setting (Okamoto 1999, 2011). For example, in a TV interview program, the participants shift from the *masu* form to the plain form to express their feelings (Ikuta 1983). Japanese elementary school teachers shift between the two forms in teaching a class (cf. Cook 1996b) and in a teachers' meeting (Geyer 2008). Japanese professors and students shift styles in academic consultation sessions (Cook 2006). Japanese mothers as well sometimes shift from the plain form to the *masu* form when serving food and correcting their child's behavior at home (Clancy 1986b; Cook 1996a). As I discuss below, even when teaching L2 learners, teachers shift between the two forms (Yamashita 1996; Wade 2003). How native speakers shift between the *masu* and plain forms is not as simple as what has been described in Japanese language textbooks. In sum, as Gumperz (1996) correctly points out, indexes such as the *masu* and plain forms are difficult to teach through direct instruction in a classroom partly because often even teachers are not aware of the range of social meanings that these forms index.

Then how do adult L2 learners of Japanese learn appropriate uses of the plain and *masu* forms in an L2 classroom? Is the instruction successful? How do learners on a study abroad program acquire style shift outside of a classroom? What factors influence their acquisition or non-acquisition? In what follows, I review studies on adult L2 learners of Japanese' acquisition of style shift in the classroom and study abroad settings, present a study on individual differences, and suggest future research directions.

2 Review of literature on L2 learners' acquisition of style shift

2.1 Classroom settings

2.1.1 Teachers' use of style shift

Yamashita (1996) investigated the style shifts of two female Japanese instructors in a college JSL (Japanese as a second language) classroom in Japan by audio-/video-recording classroom interactions, interviews, and questionnaires. She found that while the teachers mostly used the *masu* form in the classroom, they occasionally shifted to the plain form when they spoke to students in a more intimate manner. In particular, shifts to the plain form were observed when the teachers paraphrased complex sentences, scaffolded the content matter, and gave feedback to the students' answers. Yamashita's study suggests that L2 learners of Japanese are exposed to style shifts similar to those that occur in Japanese elementary school classrooms (cf. Cook 1996b). Furthermore, Yamashita found that the instructors were not quite aware of their own style shifts in the classroom. The teachers' reports and what they actually did in the classroom differed. Despite the fact that Teacher B reported that she often used the plain form, her plain form was less frequent than Teacher A. Teacher A, on the other hand, said that she kept to the *masu* form, but in reality she frequently shifted styles. Yamashita's study suggests that native speakers have little or no awareness of their own style-shifting patterns. Although Yamashita does not mention it, her study highlights the discrepancy between prescriptive description (i.e., the *masu* form is for the classroom instruction) and the teachers' actual uses (i.e., shift between the two forms).

One of the important factors in acquiring a foreign language is noticing (Schmidt, 1993, 2001); that is, in order for learning to take place, learners have to pay conscious attention to a linguistic form and its associated contexts. Research indicates, however, that most L2 learners of Japanese are not conscious of style shifts. Wade (2003) analyzed style shifts of students and teachers in six college-level Japanese language classrooms in both the United States and Japan. She provides evidence for the non-conscious nature of style shifts and also points out that the teachers' shifting patterns do not match the prescriptive description of appropriate speech style usage. She found that the teachers' style shifts were intricately related to the different identities they play (e.g., teacher, interviewer, and conversationalist) in their interaction with the students as well as different stances (e.g., formal or casual) they took toward the students and the content of talk. For example, the teachers' formal stance occurred to highlight the positional identities of the teacher (e.g., teacher as controller of the classroom discourse, teacher as lecturer, modeler, and evaluator).

2.1.2 Learners' acquisition of style shift

Cook's (2001, 2002) studies also documented that L2 learners of Japanese do not readily notice style shifts. Cook (2001) examined the pragmatic judgments of 120 American students in second-year Japanese language classes at the university level, using an on-line listening comprehension task. The students listened to the audio-recorded speech of three job applicants and were asked to choose the most appropriate applicant for the job. The speech of the three applicants, A, B, and C varied in their referential content of the message and speech style. Applicant A's referential content and speech style sharply conflicted. According to the referential content of the message, Applicant A qualified in all respects, but with respect to the pragmatic features of their speech, including speech style, she was the most inappropriate. Contrary to the instructors' expectation that no students would choose Applicant A, the study found that 80.8 percent of second-year learners chose Applicant A as the most appropriate applicant. Among the ninety-seven students who chose Applicant A, sixty-eight did not notice her impolite speech style. Only six students noticed her inappropriate speech style but could not judge it as a crucially negative factor. Only 14.2% of all the students chose Applicant C, who was the instructors' choice. In order to see if forth-year students can recognize inappropriate speech style, I conducted a study on the pragmatic judgment of 53 fourth-year students in an on-line comprehension task, employing the same material used in the 2001 study (Cook 2002). This study found a marked improvement at the forth-year level. Forty-seven percent of the students successfully judged the use of inappropriate speech styles, but fifty-three percent still failed. These studies indicate that learners find it difficult to notice and use appropriate speech styles at the beginning-level, and that even after studying Japanese for more than three years, some learners are still not capable of detecting pragmatic inappropriateness.

To find out to what extent L2 learners' conscious attention to style shifts helps the acquisition of appropriate uses of the *masu* and plain forms, Ishida (2001) examined beginning-level learners' awareness and production of the *masu* and plain forms over a period of three semesters. He asked three beginning-level American college students to observe Japanese L1 speakers' style shifts outside of the classroom and to keep journals on their observations, and he collected production data from the video-recorded role-play tasks. He refers to the prescriptive descriptions of the *masu* and plain forms as "sociolinguistic functions" and those that are outside the prescriptive descriptions as "pragmatic functions". He found that during the first semester the learners were aware of the "sociolinguistic functions" of the two forms but could not notice L1 speakers' style shift on-line. In the second semester, the learners were able to notice the "sociolinguistic functions" of the forms on-line but some inconsistent uses of the forms were observed. During the third semester, the learners noticed some "pragmatic functions" on-line. Ishida's 2009 study, which examined beginning L2 learners of Japanese over two semesters, showed evidence

that consciousness raising activities help beginning learners acquire the “pragmatic functions” of the *masu* and plain forms. In this study, he compared the experimental group (six learners) who were given consciousness raising activities and the control group (six to seven learners) who were not. The learners in both groups engaged in conversation with L1 speakers and then were asked to reflect on the style shift choice they made during the conversation with L1 speakers. In the first semester, 66.7% of the learners in the experimental group can comment on the forms they used but no one in the control group was able to make any comment. In the second semester, all learners in the experimental group were able to comment on the style shift choice they made, whereas only 28.6% of the control group learners were able to. In sum, Ishida’s study demonstrated that with conscious attention to style shifts in and outside of the classroom, even the beginning-level learners were gradually able to appropriately shift styles. Ishida’s findings are contrary to Gumperz’ (1996) claim, but the pragmatic functions Ishida successfully taught in his classes are limited to a few functions such as shifting to the plain form when expressing one’s emotion or making a soliloquial comment. There are other “pragmatic functions” associated with style shift, and whether or not these functions are teachable in the classroom is yet to be seen.

2.2 Study abroad

Study abroad provides opportunities for L2 learners to be exposed to a broader range of social contexts beyond the classroom setting. It is reported in the literature that crosslinguistically, L2 learners learn informal speech style while studying abroad and tend to overuse it when they return to their home institution (cf. Kasper and Rose 2002).

To assess the acquisition of style shift patterns of L2 learners of Japanese, Marriott (1993, 1995) conducted interview studies. Eleven Australian high school students who spent a year in Japan were interviewed by native speakers of Japanese. She found that most of the students used the plain form in the interview context – a context in which the *masu* form would be normally expected. Marriott speculates that students’ failure of acquiring the L1 norm of predominant use of the *masu* form in interviews is due to the lack of corrective feedback on norm deviations both in and outside the classroom. However, the quantitative analysis alone does not show whether or not all of the learners’ uses of the plain form were inappropriate in the interview setting, for some uses of the plain form are appropriate in the L1 norm. For example, in interviews it is natural to momentarily shift to the plain form when expressing the speaker’s emotion (Ikuta 1983) or soliloquy (Okamoto 1999). Thus, it is unknown if all the instances of the learners’ plain form in Marriott’s study were deviations from the L1 norm. Qualitative studies are necessary to determine to what extent L2 learners’ plain forms in an interview are in line with the L1 norm.

Iwasaki (2010) both quantitatively and qualitatively analyzed style shifts of five male American college students using the ACTFL Oral Proficiency Interviews (OPI) data collected before and after study abroad in Japan but came to a different conclusion than Marriott (1995)⁴. The students in this research studied Japanese in their home institution for one or two years before their departure to Japan. In the pre-OPI, all five students predominantly used the *masu* form, but in the post-OPI only two students overused the plain form while the rest used the *masu* form as the unmarked form. By qualitative analysis of the OPI's, Iwasaki found some indications of acquisition of the L1 norm by all five students, even by the two who switched the base form to the plain form in the post-OPI. For example, two students who used the *masu* form as the base form in the post-OPI often shifted to the plain form in soliloquy-like and emotive expressions, which is consistent with the L1 norm. The two students who overused the plain form employed it when talking about themselves but shifted to the *masu* form when making a request or asking a question. Iwasaki interpreted these shifts as the learners' own understanding of the social meaning of the *masu* form.

Iwasaki (2011) further studied four of the five learners two years after they returned from Japan in order to obtain their retrospective evaluation of their study-in-Japan experiences. This study illustrated the male L2 learners' dilemmas that stemmed from the gap between the social norms in Japanese society and their own preference. On the topic of speech styles, the three students who did not overuse the plain form in the post-OPI mentioned that social engagements they participated in Japan made them aware of the importance of the appropriate use of the *masu* form. At the same time, they were aware of the distance they were creating by their use of the *masu* form. In contrast, the student who overused the plain form in the post-OPI reported that he used the plain form as the default form partly due to a lack of negative feedback. In sum, with respect to the acquisition of the appropriate use of the *masu* and plain forms during study abroad, Iwasaki's (2011) studies suggest that i) there are individual variations, depending on the type of experiences learners have and ii) learners are active agents who choose a particular speech style by assessing a social identity they might project in a given social context based on their own sociolinguistic knowledge.

Interview studies such as Iwasaki's (2010) can delineate the end point of the learners' acquisition, but do not shed light on what actually happens in their interaction with L1 Japanese speakers during their stay in Japan. To find out what actually happens in interactions between L2 learners and L1 Japanese speakers, in Cook (2008a), I studied dinnertime conversations of nine pairs of study-abroad students

4 Only the two most proficient learners were given role play tasks for both *masu* and plain forms in OPI. However, the role play segments were excluded in the quantitative analysis.

learning Japanese and their host families. The students, whose Japanese proficiency-level ranged from novice to advanced on the OPI scale, were staying with the host family from three to 12 months. Qualitative and quantitative analyses of the conversations revealed that the host family members socialized the learners to the appropriate style shift patterns. The host families' style shift pattern was consistent with the normative shift pattern observed in L1 family conversation. It was found that the advanced learners' percentages of deviation from the L1 norm were much lower, while both novice and intermediate learners diverged from the L1 norm in over 70% of their utterance-final forms by shifting to the *masu* form when not appropriate. This study offered evidence that during their homestays, the learners were exposed to and socialized to non-prescriptive uses (or what Ishida (2001) calls "pragmatic functions") of the *masu* form in family conversation and started to acquire L1-like style shift in informal conversation with their host family as their Japanese proficiency level approached the advanced-level on the OPI scale. The shortcoming of this study, however, is that it is a cross-sectional study and hence does not reveal the process of acquisition over a period of time.

McMeekin's (2007) study qualitatively examined conversations between five pairs of L2 learners of Japanese and their host families over eight weeks. The learners' Japanese proficiency levels ranged from intermediate to low advanced on the OPI scale. Her findings are that while the host family members used the plain form over 80 percent of the time, the learners overwhelmingly used the *masu* form. However, four out of five learners exhibited some indications of shift from the *masu* to plain form use over the eight-week period. Although the rate of the learners' increase of the plain form is small, McMeekin's study demonstrated that the learners were socialized to use more plain forms by participating in daily interactions with the host family members who mostly spoke to them in the plain form.

In sum, while studying abroad, L2 learners of Japanese tend to increase the use of the plain form and start to acquire the L1 norm of informal conversation as their Japanese proficiency level reached the advanced-level on the OPI scale. Because native speakers of Japanese are not aware of a shift from the plain to *masu* form in family conversation, Japanese native speakers, including host families, are not able to explicitly teach appropriate shift patterns to L2 learners of Japanese. Learners must acquire the L1 norm by participating in daily activities with the host family members.

3 Individual differences: Cases of Carol and Erika

Iwasaki's (2011) study suggests that there are individual differences in the acquisition of style shift among learners. To date, however, longitudinal studies on individual differences are scarce. This section reports my recent longitudinal study of

two female American L2 learners of Japanese during a sojourn in Japan.⁵ This study investigates the two learners' acquisition of style shifts by quantitatively and qualitatively analyzing conversations of the two learners and their Japanese host family over a period of five months. It illustrates different positionings the two learners take in conversation with their host family.

3.1 Data and methodology

The data were collected by videotaping lunch/dinner time conversations of two pairs of an American L2 learner and her host family once a month for five months starting right after the learners' arrival at Tokyo. Prior to going to Japan, one of the learners, Carol, studied Japanese for a total of five years in high school and in university, and the other learner, Erika, for three years in university. Both learners were very much interested in Japanese language and culture. They participated in the same study-in-Japan program offered at O University in Tokyo and lived with a Japanese host family. The placement test given by O University at the beginning of the program placed Carol at the mid-intermediate level and Erika, at the low-intermediate level. Their host families were typical middle-class Japanese families living in Tokyo. Carol's host family was a younger couple with three young children aged 1, 3 and 5 while Erika's host family was a middle-aged couple. In the case of Carol, the first four recordings of the conversation were carried out between Carol and the host mother, and in the last recording all three children participated in the conversation. As for Erika, the regular participants of the dinnertime conversation were Erika and her host parents, and at times either her adult host siblings, or the host uncle and aunt also participated. Even when relatives participated in dinner, the conversation centered around Erika most of the time.⁶ The supplementary data include the pre- and post-interviews as well as monthly questionnaires. In the post-recording interview, both learners said that they were not consciously aware of their own speech style because they paid attention to the content of the talk. The host families mostly used the plain form. Once in a while Carol's host mother talked to the one-year old

⁵ The study on Carol was presented at the 18th International Conference on Pragmatics and Language Learning, Kobe, Japan, in 2009 and at the 2011 conference of the American Association for Applied Linguistics in Chicago.

⁶ The anonymous reviewer questioned the validity of the present data because the participants of the conversations varied between the two learners and across months. This study is not an experimental study in which learners are examined in which speech style they use when talking to the same conversational partner. The notion of "individual differences" here includes not only learners' actions but also the contexts that surround learners because their actions are in part responses to the contexts they are in. In reality, learners on study abroad are placed in different environments including their host families and other conditions (Makino 1996). This study reflects varied realities in which learners are placed in study abroad context and observes the learners' trajectories of language socialization process.

son shifting to the *masu* form, and Erika's host mother sometimes shifted to the *masu* form when she teaches her something about Japan or the Japanese language. The learners' utterance-final forms (i.e., utterance-final plain form verbs, adjectives and nouns and their *masu* form counterparts) were counted and examined with respect to speech style (*masu* or plain form). Within each speech style, the "reactive tokens"⁷, *soo desu/soo* and their variants were tabulated separately, and they are referred to as *soo-expression*. This is because the learners' speech, in particular that of Carol, indicates that they have acquired *soo-expressions* as fixed phrases. In addition, a word or expression said with rising intonation to ask for clarification of the prior turn (i.e., "next turn repair initiator" or NTRI (Schegloff, Jefferson, and Sacks 1977)) was tabulated separately, for in Erika's speech this strategy was very frequent and played an important role in achieving the goal of interaction.

3.2 Quantitative analysis

First, I present a quantitative analysis of the two learners' style shift patterns developed over the period of five months in terms of percentages of the two forms.

Carol actively participated in conversation with her host family and seemed to very much enjoy it. She expressed her opinions and feelings as well as voluntarily offered stories by narrating her past experiences and events. The average number of utterance-final form in her talk counted for tabulation is 250.2 per recording.

The quantitative analysis of Carol's speech reveals that she gradually increased the use of the plain form over five months. In the first month, 60.1% of Carol's utterances were in the *masu* form while 39.9% were in the plain form (see Figure 1). When she was a recipient of the host mother's story, she frequently produced reactive tokens often in the *masu* form. Thus, more than half of her *masu* forms were the reactive tokens, *soo desu* + FP (e.g., *soo desu ne*), while the plain form reactive tokens (e.g., *soo* and *soo soo*) were only 9.6%. The fact that she continued to use *soo desu* + FP frequently with an exception of the second month indicates that she memorized *soo* + *desu* as a chunk. Unlike *soo*-type reactive tokens, her other utterances did not occur with a final particle. Instead, they co-occurred with the connective particles, *kedo* 'but' or *kara* 'because/so.' Her connective particles, *kedo* and *kara* were in complementary distribution with respect to speech style, that is *kedo* co-occurred with the *masu* form ((*n desu kedo*), and *kara* occurred with the plain form.⁸

⁷ A reactive token is "a short utterance produced by an interlocutor who is playing a listener's role during the other interlocutor's speakership" (Clancy, Thompson, Suzuki, and Tao 1996: 355).

⁸ This fact suggests that Carol also acquired these constructions as chunks. Carol's uses of *kedo* and *kara* are not native-like and often could be used as substitutions of final particles such as *ne* or *no*.

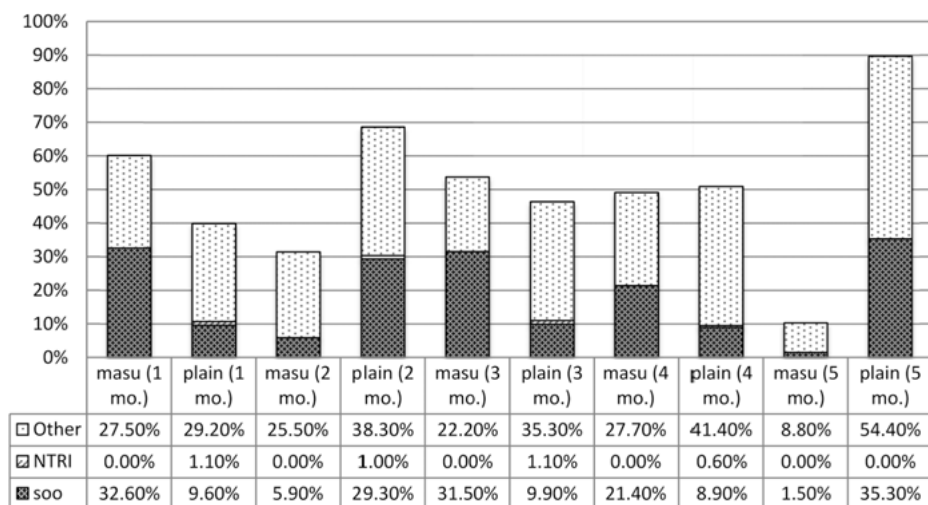


Figure 1: Carol's Speech Style Patterns (1st month–5th month)

Notes: Other – utterances other than *soo*-type reactive tokens and NTRI

NTRI – next turn repair initiator

Soo – *soo*-type reactive token

In the second month, the most notable change is that the ratio of the *masu* and plain forms was reversed. The plain form increased to 68.6% while the *masu* form decreased to 31.4%. This is primarily due to the decrease of the *masu*-form reactive token, *soo desu* +FP and the introduction of the new plain form reactive token, *soo yo ne*.⁹ Almost 30% of her utterance-final forms were *soo yo ne* in the 2nd month.

In the third month, the percentage of Carol's *masu* form became higher than the plain form again. This is mainly because she completely stopped using *soo yo ne* and switched back to *soo desu* + FP. *Soo yo ne* did not occur in the 4th and 5th recordings either. In the fourth month, the frequencies of the *masu* and plain forms became almost equal, and her non-*soo* type plain form utterances increased.

In the 5th month almost 90% of her utterance-final forms were in the plain form. The steep increase of the plain form is primarily due to the change in the participation structure. In contrast to dyadic conversation between Carol and her host mother during the first four months, in the fifth recording, the conversation was multi-party, involving Carol, the host mother and three young host siblings. In the first four months, Carol was the addressed recipient in the dyadic conversation with the host mother, but in the fifth month, she was often an unaddressed recipient while the

⁹ The host mother regularly used *soo da yo ne* instead of *soo yo ne*.

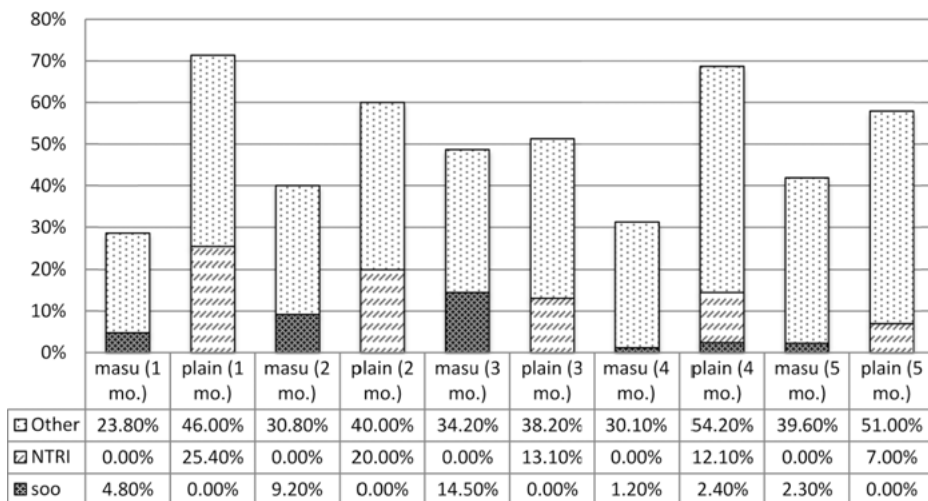


Figure 2: Erika's Speech Style Patterns (1st month–5th month)

Notes: Other – utterances other than *soo*-type reactive tokens and NTRI

NTRI – next turn repair initiator

Soo – *soo*-type reactive token

host mother and children were talking. As a result, she took far fewer turns. Furthermore, 47.5% of all her plain form utterances were directed to the children.¹⁰ In sum, Carol positioned herself as a good conversational partner of her host mother and siblings by producing frequent reactive tokens and telling stories.

Erika positioned herself differently in conversation with her host family members. She brought her electronic dictionary and notebook to the dinner table in order to learn new vocabulary. For her, dinnertime was a language learning event. Perhaps because she was preoccupied with learning new vocabulary, she was more often a hearer rather than a speaker. She rarely initiated a question or a comment. She did not engage in story-telling activities. Her utterances were typically short and contained frequent NTRI's. This pattern was unchanged over five months. For these reasons, the average number of utterance-final forms counted for tabulation is 66 per recording, much lower than that of Carol.

Erika's speech style does not follow the pattern typically seen in L2 learners of Japanese, i.e., a gradual increase of the plain form over a period of time. In the first recording, which was done soon after she arrived at Tokyo, 71.4% of her utterance-final forms were the plain form, and in the 2nd and the 3rd months the *masu* form

¹⁰ This suggests that Carol has tacit knowledge that the plain form is used for conversation with young children.

continued to increase reaching almost 50% in the 3rd month. In the 4th and 5th month, the plain form use increased again (see Figure 2).

As shown in Figure 2, 10 to 25 percent of her plain forms are “NTRI’s (next turn repair initiators)”. When she heard a word or expression she did not understand or did not make sense to her, Erika asked the meaning of a word by repeating the word or expression with rising intonation. Her NTRI was always in the plain form, and in the first month her NTRI was 25.4% of all of her tabulated utterances. Her use of NTRI decreased over five months reaching to less than 10% in the 5th month. The decrease of NTRI may suggest Erika’s gradual improvement in understanding the conversation with her host family. Erika’s reactive tokens were mostly *un’yeah*,¹¹ *hai* ‘yes’ or *honto* ‘really’ (only in the 4th month), and unlike Carol, Erika used *soo*-type reactive tokens infrequently. Although they were infrequent, Erika’s *soo*-type reactive tokens were also all in the *masu* form with the only exception of one instance of *soo* by itself in the 4th month. The final particle *ne*, which did not occur with the plain form, often accompanied the *soo*-type reactive token as in *soo desu ne* and utterances that are not reactive tokens as in *x desu ne* ‘It is X’.

As seen from the charts above, Carol’s *soo*-type reactive tokens and Erika’s NTRIs significantly contribute to the frequencies of the *masu* or plain form. I will revisit this issue in the discussion section.

3.3 Qualitative analysis

A qualitative analysis shows that Carol and Erika used plain forms in different ways for the most part. Carol used plain forms as affective and detached stance markers among others. A large part of her plain form uses were to mark affective intensity. Intensive affect was typically marked by intensifiers such as *honto ni* ‘really,’ *zenzen* ‘(not) at all’ and *zettai* ‘absolutely.’¹¹ It was also expressed at the “high point of a story” (Peterson and McCabe 1983). In example (2), Carol is talking to the host mother about Kurosawa’s samurai movie she saw. The point of the story here is that she did not understand the Japanese spoken in the samurai movie.

(2) [CP0908-11] 1st month

- 1 C: akira kurosawa no: =
Akira Kurosawa LK
‘Akira Kurosawa’s’
- 2 M: =un un ((nodding))
‘uh huh’

¹¹ This does not mean that all the affective intensity markers only co-occur with the plain form in Carol’s speech.

- 3 C: samurai eiga o mita n desu kedo:. jimaku ano: tuke [nakatta n desu kedo:
samurai movie Obj saw Nom Cop but subtitle uh attach Neg LK Cop but
'samurai movie I saw, but there were no subtitles but'
- 4 M: ((nods)) ((nods)) [un
'uh huh'
- 5 → C: ((left hand gesture)) @ ZEnzen **wakaranakatta**.@
at all understand Neg past
'I did not understand at all.'
- 6 M: a:
'Oh:'
- 7 → C: ano: mukasi no syaberikata wa honto ni **[tigau**
uh old time LK speech Top really different
'Uh, the speech in the old days is really different'
- 8 M: [**wakaranai** ne?=
understand Neg FP
'You don't understand, right?'
- 9 C: =un
'uh huh'

In line 3 she provides the background information in the *masu* form plus the connective particle *kedo* 'but.' Then in lines 5 and 7, shifting to the plain form, she states that she did not understand the Japanese spoken in the movie at all and that the Japanese spoken in the old days is really different. She emphasizes these points with affective intensifiers *zenzen* '(not) at all' and *honto ni* 'really.' Note that she pronounces *zenzen* with a louder volume at the beginning of the word. Apparently emotional intensity triggers a shift to the plain form. This example and others similar to it suggest that Carol associates the plain form with the expression of affective intensity.

In the third month, Carol at times narrated in the naked plain form to index her detached stance toward her story. The naked plain form, which does not co-occur with affect keys such as final particles, typically is used in newspapers and scientific writings and indexes the speaker/writer's detached stance. In example (3) Carol is telling the host mother what American meat pie is.

(3) [CP1108-42] 3rd month

- 1 C: ((left hand movement)) sore wa: ringo to:
that Top apple and
'That has apples and'
- 2 M: un ((nods))
'uh huh'

- 3 C: reezun to: iroiro supaisu? ((looks at M))
raisin and various spice
'raisins and various spices'
- 4 M: un un un un un ((nodding))
'um um um um'
- 5 → C: ga aru kara tyotto (.) n: (.) dentooteiki na **azi**.
Sub exist so a little traditional taste
'so a little (.) uh (.) traditional taste.'
- 6 M: hu:[n.
'uhm'
- 7 → C: [nanka mukasi no **azi**. (.)
somewhat old-time LK taste
'sort of old-time taste.'
- 8 atasi wa betu ni suki zya nai n desu kedo.=
I Top particular like Neg Nom Cop but
'I do not like it that much though.'
- 9 M: ((starts eye contact with C)) appurupai de wa nai n desyo?
apple pie Neg Nom Cop
'It's not an apple pie?'
- 10 → C: hai. ((slightly shrugs)) betu ni **nai**.
Yes particular Neg
'Right. It's not.'

Carol is providing a description of American meat pie using the naked plain form in lines 5, 7 and 10 which indexes her detached stance toward the description of the pie. In contrast to the description of the pie that is given in the naked plain form, in line 8 Carol adds her personal preference shifting to the *masu* form + *kedo* 'but.'

In contrast, Erika's use of the plain form is characterized by frequent occurrences of NTRIs. In example (4), Erika does not understand the meaning of the expression *hana o ikeru* said by the host mother. She produces a NTRI by repeating the expression with rising intonation.

(4) [ER 0908] 1st month

- 1 M: u::n (.) sosite hana kadoo hana o **ikeru** ((with gesture))
and flower flower arrangement flower Obj arrange
'U::n and flowers flower arrangement, to arrange flowers.'
- 2 → E: hana o **ikeru**?
Flower Obj arrange
'to arrange flowers?'

She also uses the plain form for assessment. In example (5), the host mother is teaching Erika the numeral classifier for bowls of rice in Japanese.

(5) [ER 1008] 2nd month

- 1 M: un gohan wa itizen nizen
 un rice Top one bowl two bowl
 'Uh (we count) bowl of rice one zen, two zen.'
- 2 → E: **muzukasii**
 difficult
 'It's difficult.'

Erika's assessment in line 2 is in the plain form. Out of her 42 instances of assessment she used over five months, 31 instances (73.8%) are in the naked plain form and only eleven instances (26.2%) of her assessments are in the *masu* form. Assessments that co-occur with the final particle *ne* are always in the *masu* form as shown in (6),¹² which suggests that like Carol, she learned the sequence *X desu + ne* as a chunk.

(6) [ER 0908] 1st month

- 1 M: soo nee amerika o sutaato site wan uiiku
 so FP America Obj start do one week
 'uhm it's been a week since you left America.'
- E: un
 'Yeah'
- 3 M: aa: **hayai** nee?
 uh fast FP
 'Uh (the time has gone by) fast'
- 4 E: uhm
 'uhm'
- 5 M: a:::
 'uh::'
 ((eating))
- 6 → E: hayai desu ne
 fast Cop FP
 '(the time is gone by) fast'
- 7 F: **hayai** ne
 fast FP
 '(the time is gone by) fast'

In example (6), the host mother mentions that since Erika left America, one week has passed. Then she produces an assessment in the plain form, *hayai nee*

¹² However, the converse is not true. Not all instances of the *masu*-form copula (*desu*) co-occur with the sentence-final particle *ne*.

‘(The time has gone by) fast *nee*.’ Erika first reciprocates the host mother with a minimal reactive token *uhm*, but aligns herself with the host mother with the *ne*-marked assessment in line 6. The sentence-final particle *ne*, which is crucial to create an alignment between Erika and the host mother here, seems to trigger the *masu* form of the copula *desu*.

Erika asked questions rather infrequently, but for the first three months all her questions were in the *masu* form. During the fourth month, some of her questions were in the plain form. When she answered a question, Erika switched between the *masu* and plain forms rather haphazardly. This tendency did not change over five months. In an interview after the recordings were made, she said that she was not aware of the speech style she used and that she was often frustrated when she could not say what she wanted to say in Japanese. Perhaps because she was so focused on learning new vocabulary, she did not pay attention to speech style.

4 Discussion

In line with the research on L2 learners studying European languages (e.g., Barron 2006), the earlier studies on learners' frequencies of the *masu* and plain forms found that learners tend to increase the use of the less formal style (i.e., the plain form) during their sojourn in Japan. However, the examination of learners' frequencies of the *masu* and plain forms alone is not an adequate indicator of L2 learners' acquisition of style shift. There are complex social, cognitive, and interactional factors involved in the choice of speech style. The findings of the previous research and my recent study reported above suggest some of the complex factors that merit further investigation. I will discuss four below.

4.1 Noticing

Schmidt (1993, 2001) claims that in order to acquire L2 pragmatic knowledge, conscious noticing is necessary. Despite the fluid nature of non-referential indexes, Ishida's (2001, 2009) studies demonstrate that conscious noticing plays an important role in the acquisition of the *masu* and plain forms. In the cases of Carol and Erika, what is noteworthy is that they were unaware of their own speech styles and those of the host family members. While her increased use of plain form over five months seems to indicate some evidence of implicit socialization to the L1-like norm of informal conversation, Carol's speech style in conversation with the host mother does not reach the L1 norm of informal conversation. This is mainly because her plain forms do not co-occur with a final particle and there are shift patterns that do not conform to the L1 norm of informal conversation. In Japanese ordinary conversation among

people in close relationships such as family members, frequent co-occurrence of the plain form and final particles such as *ne*, *no* and *yo* is the norm (e.g., Cook 2008a). In Carol's speech to the host mother, the final particles *ne* and/or *yo* occur mainly in reactive tokens in the *masu* form (e.g., *soo desu ne*). The lack of final particles in her plain form utterances that are not reactive tokens clearly constructs Carol as a learner of Japanese. Furthermore, her reactive tokens in the *masu* form (*soo desu* + FP) indexes a distant social relationship, which is not the L1 norm of informal conversation. Barron (2006) reports that 33 Irish learners of German did not acquire the L1 norm of German address terms after a ten-month sojourn in Germany. She attributes the learners' failure of acquiring the L1 norm to insufficient appropriate input. However, in the cases of Carol and Erika, they had sufficient appropriate input of informal conversation from their host families. The failure to consciously "notice" the host family's speech style may have kept them from acquiring L1-like shift patterns. In sum, conscious noticing of indexical meaning is important for the acquisition of style shift.

4.2 L2 learners' sociolinguistic knowledge

As illustrated in Iwasaki's (2011) study, learners' sociolinguistic knowledge influences the choice of speech style. Even when learners are not aware of their speech style, their tacit sociolinguistic knowledge may play a part. In the fifth month when Carol mainly talked to the young host siblings, her speech style conformed to the L1 norm of informal conversation, which consists of the predominant use of the plain form accompanied by a final particle and the plain form reactive tokens.¹³ This suggests that although she is not consciously aware of her speech style, she has a tacit understanding that the plain form is for talking to young children. In the post-recording interview, Carol said that she was under the impression that the host mother was speaking in the *masu* form because she was polite to Carol. Due to her false perception of the host mother's speech style, perhaps Carol intended to reciprocate the host mother by mixing the *masu* form based on her own sociolinguistic knowledge of Japanese (i.e., use the *masu* form to be polite). Even when learners' sociolinguistic knowledge is tacit, they seem to employ their knowledge for speech style choice. How learners develop and use their own sociolinguistic knowledge of style shift merits future research.

4.3 Learners' positioning in conversation

As mentioned above, Carol and Erika positioned themselves in conversation with the host family in different ways. For Carol, the mealtime with the host family members

¹³ Because her interactions with the young host siblings were recorded only in the 5th month, it is not known if she started to talk to the children this way from the beginning of her homestay.

was a social event in which she played the role of a good conversational partner by producing frequent reactive tokens and expressed her ideas and feelings by telling stories whereas for Erika the mealtime with the host family was time to learn the target language. She spent most of the mealtime with her host family members listening to their conversation and checking a dictionary. When she came across words and expressions she did not understand, she asked the meaning by producing an NTRI. Carol's frequent uses of the reactive token *soo+desu+FP* and Erika's frequent plain form NTRI are linked to their respective positionings, namely a conversational partner for Carol and a language learner for Erika. Carol's dominant speech styles in the first four months are correlated with those of her reactive tokens. Erika's plain form dominance is correlated with her frequent use of plain-form NTRI. Thus, the frequencies of the *masu* and plain forms need to be examined with respect to L2 learners' positioning in conversation and how such positionings produce certain actions (e.g., production of reactive tokens or NTRI).

4.4 L1 speakers' expectations

The research (Ino 1999; Iwasaki 2011; Ohta 1993; Siegal 1996) suggests that L1 speakers' low expectation of L2 learners' acquisition of Japanese may negatively affect L2 learners' acquisition. Host families and local communities do not expect L2 learners to speak Japanese like L1 speakers. They even encourage minimal proficiency of Japanese. Ino (1999) illustrates that Japanese host families have a different set of norms for L2 speakers. Siegal (1996) discusses that often L2 learners are positioned as "others". Ohta (1993) and Iwasaki (2011) report cases in which male L2 learners are discouraged from using male language in Japanese because "foreigners" should not use "vulgar" language. Iwasaki (2011: 84) points out, "... their [L2 learners'] choice of speech styles was both affected by their personal preference (i.e., the language they feel comfortable with) and their perception of the language they were expected to use as a *foreigner*...". In other words, learners may make conscious choices of speech styles based on what is comfortable or easy for them and their perception of L1 speakers' expectations of foreigners, which they gained through their own experiences living in Japan. For example, one of the speakers in Iwasaki's study, Greg chooses to speak in the plain form even to his teachers because he has learned that a foreigner's plain form speech is accepted. The low expectation of foreigners' Japanese language proficiency derives from the ideology that Japanese people own the Japanese language (Miller 1977). However, it is important to examine to what extent and in what social contexts such an ideology affects L2 learners' acquisition of pragmatic features. In addition, the previous research has only investigated Western L2 learners, who are ethnically Caucasian. It is not known to what extent native speakers of Japanese expect non-Western L2 learners of Japanese to acquire the language.

5 Conclusion

This chapter has summarized a body of research on the acquisition of the *masu* and plain forms by L2 learners of Japanese, examined learners' individual differences, and discussed issues that merit future research. The research reviewed examined both the classroom setting and study abroad context. Due to the multifunctional nature of an index, the *masu* and plain forms are difficult to teach in the classroom. However, there is evidence that the activity of consciousness raising may successfully teach some functions of these forms in the classroom. Study abroad provides good opportunities to learn the native norm of style shifts. Although advanced learners begin to acquire L1-like norms, a complex web of factors may affect the acquisition processes. The factors discussed are noticing, L2 learners' sociolinguistic knowledge, L2 learners' positioning in conversation and L1 speakers' expectations. Learners vary with respect to noticing, sociolinguistic knowledge of the target language, and positioning in conversation. In addition, varied experiences learners have while living in Japan increase individual differences among learners. Learners may or may not choose to converge toward the L1 norms (Ishihara and Tarone 2009). Iwasaki (2011) states that the target language of the learners in her study is not the language that conforms to the norm of the target language but the language that is constituted by the learners' own preferences and their perceptions of L1 speaker's language ideology. The recent trend of L2 research questions the validity of a "native speaker norm" because such norms are fluid and vary among L1 monolingual speakers (cf. Cook 1999; Swain and Deters 2007). As a result, the end point of acquisition is not the L1 norm, for such a norm may not exist. Future research could explore what constitutes the target language for L2 speakers and how that affects the acquisition processes.

Transcription conventions:

[overlapped speech	(.)	short pause
=	latching	@	laugh
(())	commentary	WORD	loudness
::	sound stretch	<u>kimasu</u>	the <i>masu</i> form
?	rising intonation	kuru	the plain form

Abbreviations used in Word-for-Word Translations

Cop	various forms of copula	Nom	nominalizer
FP	final particle	Obj	object marker
Lk	linking nominal	Sub	subject marker
Neg	negative morpheme	Top	topic marker

Acknowledgments

This work is supported by Japan Studies Endowment Faculty Research Award and University Research Council Research Relations Fund at the University of Hawaii. I am grateful to Yumiko Enyo and Yuri Ogura for help with transcription of the data. I would also like to thank Masahiko Minami for his valuable comments.

References

- Barron, Anne. 2006. Learning to say 'you' in German: The acquisition of sociolinguistic competence in a study abroad context. In Margaret A. Dufon and Eton Churchill (eds.), *Language learners in study abroad contexts*, 59–90. Clevedon, England: Multilingual Matters.
- Clancy, Patricia M. 1986a. The acquisition of communicative style in Japanese. In Bambi B. Schieffelin and Elinor Ochs (eds.), *Language socialization across cultures*, 213–250. New York: Cambridge University Press.
- Clancy, Patricia M. 1986b. The acquisition of Japanese. In Dan Slobin (ed.), *The cross linguistic study of language acquisition*, 373–524. Hillsdale, N.J.: Erlbaum.
- Clancy, Patricia, Sandra A. Thompson, Ryoko Suzuki and Hongyin Tao. 1996. The conversational use of reactive tokens in English, Japanese and Mandarin. *Journal of Pragmatics* 26(3). 355–387.
- Cook, Haruko M. 1996a. Japanese language socialization: Indexing the modes of self. *Discourse Processes* 22(2). 171–197.
- Cook, Haruko M. 1996b. The use of addressee honorifics in Japanese elementary school classroom. In Noriko Akatsuka, Shoichi Iwasaki and Susan Strauss (eds.), *Japanese/Korean linguistics* Vol. 5, 67–81. Stanford, CA: Center for the Study of Language and Information.
- Cook, Haruko M. 2001. Why can't learners of Japanese as a foreign language distinguish polite from impolite speech styles? In Kenneth R. Rose and Gabriele Kasper (eds.), *Pragmatics in language teaching*, 80–102. New York: Cambridge University Press.
- Cook, Haruko M. 2002. *Pragmatic judgments on politeness: A case study of 400-level JFL students*. Paper presented at the American Association for Applied Linguistics Salt Lake City, UT, 6–9 April.
- Cook, Haruko M. 2006. Japanese politeness as an interactional achievement: Academic consultation sessions in Japanese universities. *Multilingua* 25(3). 269–292.
- Cook, Haruko M. 2008a. *Socializing identities through speech style: Learners of Japanese as a foreign language*. Bristol: Multilingual Matters.
- Cook, Haruko M. 2008b. Organization of turns, speech styles and postures in a Japanese elementary school. In Junko Mori and Amy Snyder Ohta (eds.), *Japanese applied linguistics: Discourse and social perspectives*, 80–108. London, England: Continuum International Publishing.
- Cook, Vivian. 1999. Going beyond the native speaker in language teaching. *TESOL Quarterly* 33(2). 185–209.
- Geyer, Naomi. 2008. Style shift as facework: The use of plain and *masu* forms in faculty meetings. In Kimberly Jones and Tsuyoshi Ono (eds.), *Style shifting in Japanese*, 39–70. Amsterdam and Philadelphia: John Benjamins.
- Gumperz, John J. 1982. *Discourse strategies*. New York: Cambridge University Press.
- Gumperz, John J. 1996. The linguistic and cultural relativity of inference. In John J. Gumperz and Stephen C. Levinson (eds.), *Rethinking linguistic relativity*, 374–406. New York: Cambridge University Press.

- Īino, Masakazu. 1999. Language use and identity: An ethnographic study of dinner table conversation between Japanese host families and American students. In Lawrence F. Bouton (ed.), *Pragmatics and language learning* Vol. 9, 129–162. Urbana-Champaign, IL: University of Illinois, Urbana-Champaign, Division of English as an International Language.
- Ikuta, Shoko. 1983. Speech level shift and conversational strategy in Japanese discourse. *Language Science* 5(1). 37–53.
- Ishida, Kazuto. 2001. Learning the pragmatic functions of the Japanese “*masu*” and plain forms. Paper presented at the Annual Meeting of the Pacific Second Language Research Forum. Honolulu, HI, 4–7 October.
- Ishida, Kazuto. 2009. Indexing stance in interaction with the Japanese *desu/masu* and plain forms. In Naoko Taguchi (ed.), *Pragmatic competence*, 41–67. Berlin and Boston: De Gruyter Mouton.
- Ishihara, Noriko and Elaine Tarone. 2009. Subjectivity and pragmatic choice in L2 Japanese: Emulating and resisting pragmatic norms. In Naoko Taguchi (ed.), *Pragmatic competence*, 101–128. Berlin and Boston: De Gruyter Mouton.
- Iwasaki, Noriko. 2010. Style shifts among Japanese learners before and after study abroad in Japan: Becoming active social agents in Japanese. *Applied Linguistics* 31(1). 271–296.
- Iwasaki, Noriko. 2011. Learning L2 Japanese “politeness” and “impoliteness”: Young American men’s dilemmas during study abroad. *Japanese Language and Literature* 45(1). 67–106.
- Jones, Kimberly and Tsuyoshi Ono (eds.). 2008. *Style shifting in Japanese*. Amsterdam and Philadelphia: John Benjamins.
- Kasper, Gabriele and Kenneth R. Rose (eds.). 2002. *Pragmatic development in a second language*. Malden, MA: Blackwell.
- Makino, Seiichi. 1996. Hōmu sutei ni okeru Nihongo gakushū kōka [Effects of language acquisition in home stay context]. In Kamata, Osamu and Hiroyuki Yamauchi (eds.), *Nihongo kyōiku ibunkakan komyunikeishon: Kyōshitsu hōmu-sutei chiiki o musubu mono* [Japanese language education and intercultural communication: Linking classroom, home stay and community], 41–61. Hokkaidō Kokusai Kōryū Sentā.
- Marriott, Helen. 1993. Acquiring sociolinguistic competence: Australian secondary students in Japan. *Journal of Asian Pacific Communication* 4(4). 167–192.
- Marriott, Helen. 1995. The acquisition of politeness patterns by exchange students in Japan. In Barbara F. Freed (ed.), *Second language acquisition in a study abroad context*, 197–224. Amsterdam and Philadelphia: John Benjamins.
- Matsumoto, Yoshiko and Shigeko Okamoto. 2003. The construction of the Japanese language and culture in teaching Japanese as a foreign language. *Japanese Language and Literature* 37(1). 27–48.
- Maynard, Senko. 1993. *Discourse modality: Subjectivity, emotion and voice in the Japanese language*. Amsterdam and Philadelphia: John Benjamins.
- McMeekin, Abigail. 2007. Learners of Japanese and socialization through expert-novice negotiation in a study abroad setting. Paper presented at the 17th Conference on Pragmatics and Language Learning. Honolulu, HI, 26–28 March.
- Miller, Roy A. 1977. *The Japanese language in contemporary Japan: Some sociolinguistic observations*. Washington, D.C.: American Enterprise Institute for Public Policy Research.
- Ochs, Elinor. 1996. Linguistic resources for socializing humanity. In John J. Gumperz and Stephen C. Levinson (eds.), *Rethinking linguistic relativity*, 407–437. New York: Cambridge University Press.
- Ohta, Amy S. 1993. The foreign language learner in Japanese society: Successful learners of Japanese respond to Miller’s law of inverse returns. *Journal of the Association of Teachers of Japanese* 27(2). 205–228.
- Okamoto, Shigeko. 1999. Situated politeness: Manipulating honorific and non-honorific expressions in Japanese conversation. *Pragmatics* 9(1). 51–74.

- Okamoto, Shigeko. 2011. The use and interpretation of addressee honorifics and plain forms in Japanese: Diversity, multiplicity, and ambiguity. *Journal of Pragmatics* 43(15). 3673–3688.
- Peirce, Charles S. 1955. *Philosophical writings of Peirce*. New York: Dover Publishers.
- Peterson, Carole and Allyssa McCabe. 1983. *Developmental psycholinguistics: Three ways of looking at a child's narrative*. New York: Plenum.
- Schegloff, Emanuel A., Gail Jefferson and Harvey Sacks. 1977. The preference for self-correction in the organization of repair in conversation. *Language* 53(2). 361–382.
- Schmidt, Richard. 1993. Consciousness, learning and interlanguage pragmatics. In Gabriele Kasper and Shoshona Blum-Kulka (eds.), *Interlanguage pragmatics*, 21–42. Oxford, England: Oxford University Press.
- Schmidt, Richard. 2001. Attention. In Peter Robinson (ed.), *Cognition and second language instruction*, 3–33. New York: Cambridge University Press.
- Siegal, Meryl. 1996. The role of learner subjectivity in second language sociolinguistic competency: Western women learning Japanese. *Applied Linguistics* 17(3). 356–382.
- Silverstein, Michael. 1976. Shifters, linguistic categories and cultural description. In Keith Basso and Henry Selby (eds.), *Meaning in anthropology*, 11–55. Albuquerque: University of New Mexico.
- Silverstein, Michael. 2001. The limits of awareness. In Alessandro Duranti (ed.), *Linguistic anthropology: A reader*, 382–401. Malden, MA: Blackwell.
- Swain, Merrill and Ping Deters. 2007. “New” mainstream SLA theory: Expanded and enriched. *The Modern Language Journal* 91 (Issue Supplement s1). 820–836.
- Taguchi, Naoko. 2009. Pragmatic competence in Japanese as a second language: An introduction. In Naoko Taguchi (ed.), *Pragmatic competence*, 1–18. Berlin and Boston: De Gruyter Mouton.
- Wade, Jane. 2003. *Searching for “place” in the Japanese language classroom: linguistic realizations of social identity in discourse and the acquisition of sociopragmatics*. Unpublished doctoral dissertation, University of California, Berkeley.
- Yamashita, Sayoko. 1996. Formal-informal style shifting in university JSL teacher talk. *Research Studies in TESOL* 4, 23–54. Tokyo: Temple University, Japan.

Noriko Kobayashi

7 Japanese language proficiency assessment with the Simple Performance-Oriented Test (SPOT) as a primary focus

1 Introduction

The purpose of assessing foreign language proficiency is to demonstrate learners' language abilities in realistic use in their target language domains. Assessment is based on established criteria and ratings are made in accordance with the goals of the assessment. In addition to so-called language tests, there are also rating methods that do not employ traditional testing methods, such as portfolios, class observations, and learners' self-assessments. In this chapter, we will discuss language proficiency testing¹ in particular.

Early language proficiency testing mainly featured translation testing. Until recently, this had changed to more objective and scientific language testing, which measures linguistic knowledge mainly in regard to grammar and vocabulary. Further developments and improvements in testing methods have resulted in the current situation, in which we evaluate the learner's ability to actually use the language in communication by implementing performance task testing.

This chapter consists of 5 sections, including this section. The next section, section 2, briefly overviews the history of language testing, section 3 discusses contemporary trends in assessment, which tend towards direct performance testing, in which the raters will evaluate the test-takers performance directly, and section 4 outlines the recent tendencies of the Japanese Language Proficiency Test (JLPT), which is the most popular among Japanese language proficiency tests.

Finally, in section 5, a unique language test called the Simple Performance-Oriented Test (SPOT), developed by the present author and Ford-Niwa (Kobayashi and Ford 1992), will be introduced and discussed. The SPOT method is based on the authors' original idea and no other such language test exists in Japanese or any other languages, as far as the author is aware. The idea of SPOT originated from a unique Japanese language feature that one-mora sound corresponds to one letter (*hiragana*), which may eventually affect grammatical function. However, it would be possible to apply the SPOT to other languages by modifying the test items in accordance with syllable composition of the word featured for individual languages. It is often said that a direct-test like a conversation test should be carried out in

¹ The term "proficiency test" is usually used in contrast to "achievement test," which evaluates whether each learner has reached a goal set in the class in a certain period of time.

order to measure communicative capability (see section 3). The SPOT, however, is an indirect test; a convenient measure to infer test-takers' communication ability in the real world based on its score. Its results are mechanically marked and scores are easily obtained. Since the test requires only a short time to conduct, the SPOT has now been widely introduced in Japanese language education sites and the research field. The theoretical background of the SPOT will be discussed particularly from the viewpoint of its authenticity.

2 History of proficiency assessment

The study of proficiency assessment is closely related to various fields such as linguistics, language acquisition, sociology, psychology; the history of research done in these fields strongly reflects that of research on language testing.

In the 1960s when structuralism (e.g., Bloomfield 1933) was highly regarded in linguistics, the audio-lingual method was popular in the field of language education because it stressed the importance of sentence structure. At the same time, as stated in Lado (1961), measurement of linguistic knowledge by detailed testing of discrete components like grammar and vocabulary was becoming a mainstream in language testing. We call such tests *discrete point tests*. Such tests are based on the view that the level of language proficiency is ascertainable by a synthesis of the knowledge of each linguistic component. The discrete point test (usually performed by using paper and pencil in a multiple choice format) was recognized as a scientific and objective test at that time, especially when compared to previous translation testing methods. The discrete point test method still has a strong influence in the field of second language teaching.

Arguing against structuralism, Chomsky (1965) proposed the notions of linguistic competence and performance. Arguing against this distinction, which he perceived to be artificial, Hymes (1972) introduced the notion of communicative competence, which essentially maintains that linguistic competence and social performance are inseparable. Hymes' research was highly influential on the development of the communicative approach in language teaching.

In parallel with the ever changing field of linguistics, opinions differing from Lado's have been raised in the field of language testing. Carroll (1961) claimed that an integrative approach is required to evaluate language capability in practical and complex communication. He pointed out that the total score of discrete-testing per se does not necessarily reflect the whole language capability of learners. Dictation testing (e.g., Oller 1971; Savignon 1982), cloze testing (e.g., Chappell and Abraham 1990; Oller and Conrad 1971; Taylor 1953) and noise testing (Spolsky et.al. 1968) were proposed as integrative measures of overall language ability. These tests are different from the traditional paper and pencil tests focusing on discrete points of language.

At present, the call for performance-based assessment is inspiring a new movement to measure communicative ability (Bachman 1990; Bachman and Palmer 1996; McNamara 2000), and various performance tests are now in use, such as the oral proficiency interview (OPI) of the American Council on the Teaching of Foreign Languages (ACTFL).

A recent concern relating to proficiency assessment is the methodology of rating by using a list of statements reflecting what examinees can or cannot do in the target language in the various modalities of writing, reading, speaking, and listening. Examiners (raters) judge whether or not examinees can achieve each of the various items (statements) on the list. Therefore, the results of the checked lists are taken as a measure of the examinees' levels of language skill.

Among language proficiency scales with such descriptors are the Common European Framework of Reference for Languages (CEFR) (Council of Europe 2001), the ACTFL (American Council on the Teaching of Foreign Languages) Proficiency Guidelines (ACTFL 2012), and the ILR/FSI (Interagency Language Roundtable) proficiency scale (www.govtil.org/index.htm). Each of these scales differs according to the rater, ratee, and the purpose of the rating. Additionally, if the ratee is a child, it may be necessary to apply a scale differing from these, which have been developed to rate adults.

The CEFR has been in development by the Council of Europe since 1971 in order to answer the need for a common reference framework for foreign language learning as student interchange became more active within Europe during European unification. An English version of the framework was released in 2001, and by 2012, it had been translated into 38 languages, making it widely available for use. The framework itself consists of six levels, from A1 to C2. At the time of writing, the CEFR framework is drawing attention not only in Europe, but throughout the world.

Concerning the Japanese language, the Japan Foundation² has announced the “JF Standard 2010”, which is based on the CEFR (Japan Foundation 2010a). The standard is based on the six CEFR levels. The relationship of the JF levels to the 5 levels of the JLPT (see section 4) has also been studied and reported on (see <http://jfstandard.jp/>). The influence of the JF standard in the areas of curriculum design and the development of practical teaching materials has been gradually increasing.

The ACTFL Proficiency Guidelines “were first published in 1986 as an adaptation for the academic community of the U.S. Government’s Interagency Language Round Tables (ILR) Skill Level Descriptions” (ACTFL 2012). The need for such an adaptation arose from the fact that the ILR scale was originally developed for use on government employees, and so had a focus on describing the higher levels. For general language learners, however, there was a greater need for detailed descriptions of

² The Japan Foundation is a governmental institution that promotes various aspects of Japanese culture and language throughout the world.

the lower levels, and so the ACTFL Proficiency Guidelines were developed to answer this need. In regard to the levels, “for each skill, these guidelines identify five major levels of proficiency: Distinguished, Superior, Advanced, Intermediate, and Novice. The major levels Advanced, Intermediate, and Novice are subdivided into High, Mid, and Low sublevels.” (ACTFL 2012)

The ACTFL-OPI is the most well-known and influential among the ACTFL assessments. As an oral proficiency interview, it is famous not only in America, but in Japan as well. This assessment involves a trained and certified rater conducting a 20 to 30 minute interview according to a standardized structure and elicitation protocol. The interview is audio recorded and rated according to the ACTFL Proficiency Guidelines. In Japan, the OPI was first introduced in a workshop in 1990 by Seiichi Makino, and has since become widely known (<http://www.opi.jp/shokai/gaiyo.html>; in Japanese). The ACTFL-OPI is recognized as having high reliability and validity as it directly assesses the speaking abilities of ratees on an individual basis.

Since the CEFR, JF Standard, and ACTFL-Proficiency Guidelines each indicate proficiency levels, they describe what ratees can do in the language in regard to each level or skill. Furthermore, each assessment aims not only at measuring the linguistic competence of ratees, but also their real world language use skills, including sociolinguistic and pragmatic competence.

The issue of how to choose suitable descriptions for such can-do statements in order to illustrate language competencies in several levels of several language skills constitutes a central subject in the field of assessment study at present. How the validity of performance assessment can be guaranteed will be a main topic for current research.

3 Performance assessment and its test validity

Although communicative capability has become the main concern in assessing language proficiency, it is not easy to measure it in practice. Emphasizing the importance of authenticity in test validity, Bachman and Palmer (1996: 23) maintain that “[r]eliability is a necessary condition for construct validity, and hence for usefulness, [although] reliability is not a sufficient condition for either construct validity or usefulness.” Bachman and Palmer also argue that test validity should be checked by comparing features of test tasks with those of real tasks in the target language use (TLU) domain. If the degree of correspondence of mutual features is high, the authenticity of the test task is considered to be high, and consequently the test is well validated. Their view suggests that we should make performance task for tests closely reflect conditions in the real world that test-takers will encounter.

However, the reality is that language tests are not always representative of actual communication, and test-takers may be forced to deal with affective factors

as they perform tasks while conscious of being rated (McNamara 2000). Accordingly, an unresolved concern is that test results might be influenced by factors other than language competence – thus limiting the authenticity of the test.

Actually, we are physically limited to executing only a limited number of test tasks within the time allotted. In order to maintain standards of fairness toward a variety of test-takers with different cultural background knowledge, the contents used for such contextualized test tasks have to be carefully selected and prepared so that non-linguistic knowledge does not become an influential factor. However, even if the test tasks are prepared with such care, it is impossible for the test results to avoid the influence of familiarity with the topics on some level. It is clear that the test-takers who are knowledgeable about the topics in the test tasks can perform better in every type of skill (reading, listening, speaking, and writing) in comparison to unknowledgeable test takers. Since the contents of test tasks are typical samples of language usage in our lives, the test-taker's overall ability to use the language is inferred from such sample tasks. If the test-takers fail on the sample tasks of the test due to deficiencies other than linguistic competence, evaluation of their language proficiencies will become grossly inaccurate. To avoid such inaccurate assessment, it is crucial that contextualized test tasks be prepared very cautiously in regard to their topics.

Even if we are able to prepare well-elaborated, highly authentic and valid test tasks as conversation tests or writing tests, well-trained raters are still necessary for rigorous rating. It may be difficult to avoid the influence of the rater's personal subjectivity, even in the case of trained raters. Discussing the issue of raters, McNamara (2000) explains why introducing a rater into the assessment process is both necessary and problematic. He says that when concerns for reliability dominated language assessment in 1950s and 1960s, rater-mediated assessment was discouraged because of the problem of subjectivity. On the other hand, McNamara (2000: 38) also states that “much was lost by this restriction on the scope of assessment” and points out that “with the advent of communicative language teaching, with its emphasis on how linguistic knowledge is actually put to use, understanding and managing the rating process became an urgent necessity.”

Currently, efforts are being made to find an objective method of assessing proficiency by using performance testing so that the influence of the rater's personal subjectivity may be avoided. The descriptions of the ACTFL-Proficiency Guidelines, or of the CEFR are typical examples that have considerable influence in the field of language assessment at present.

Even if such guidelines or statements for each proficiency level solve the problem of rating, performance tests such as oral-interview tests may still require a certain period of time wherein many candidates may be individually observed. The time and labor involved in such tests are enormous, and administration to large numbers of candidates will be difficult.

4 The Japanese Language Proficiency Test (JLPT)

Reflecting the changes in the view of language tests described above, the JLPT, which was revised in 2010, now places a greater emphasis on communication abilities than before (Japan Foundation 2010b). The JLPT is now the largest-scale Japanese-language test in the world, with approximately 610,000 examinees in 62 countries and areas in the world (as of 2011). Major changes are as follows: (1) examinees can now take the JLPT twice a year; (2) the number of testing levels has increased from 4 levels to 5 levels; (3) the test score allocation has been altered so as to place a greater emphasis on hearing ability and less on grammar and vocabulary; (4) instead of using raw scores (based on the number of correct answers) as used in the old JLPT(OT), the new JLPT(NT) has adopted scaled scores based on the equalization method. It is generally held that scaled scores more accurately and fairly indicate language ability.

The composition of test sections and their score allocations, which reflect the concept of the new JLPT, are summarized in Table 1. The formats of test sections in the new JLPT are basically the same as those of the former, which examine linguistic knowledge in vocabulary and grammar as well as performance skills in reading and listening. However, the allocated time distribution, score classification, and allocated scores for the test sections are different. For example, N1³ level, which is compatible to the old Level 1, is shown in Table 1.

Table 1: Comparison of New Test with Old Test (cited from the JLPT web-site)

Old Test: Level 1

Sections	Test Time	Points (raw scores)
Writing-Vocabulary	45 min.	100 points
Listening	45 min.	100 points
Reading-Grammar	90 min.	200 points
Total	180 min.	400 points

New Test: Level N1

Test sections	Test Time	Scoring sections	Range of scores (scaled scores)
Language Knowledge (Vocabulary and Grammar)	110 min.*	Language Knowledge (Vocabulary and Grammar)	0~60
Reading		Reading	0~60
Listening		Listening	0~60
Total	170 min.	Total Scores	0~180

*Note that the combined time for the vocabulary and grammar tests is 110 minutes.

3 “N” stands both for Nihongo [or Japanese] and New.

Comparing the new test with the old, we can observe the following differences.

- (1) Test sections and scoring sections: In the old test (OT), several test sections shared a corresponding scoring section. Contrastingly, in the new test (NT), while only two test sections are provided – one is of script-material testing and the other, audio-material testing – the script-material section is further divided into language knowledge (vocabulary and grammar), and reading comprehension, and the scoring sections of the language knowledge and reading sections are separated. Furthermore, in the OT the grammar and reading sections were in the same scoring section. This change in the NT of separating score sections of the reading and language knowledge sections is one indication that the NT is more conscious about separating knowledge from skills.
- (2) Test times: In the OT, the total time allocated to the test for script material, i.e., Writing-Vocabulary and Reading-Grammar were 135 minutes altogether, but in the NT, these two sections were combined into one and it is shortened to 110 minutes. On the other hand, the time for the test using audio is lengthened from 45 to 60 minutes. This change of time allocation also reflects a concern for communication skills.
- (3) Scores: 60 points out of the total 180 are allocated to the listening comprehension sections in the NT, while in the OT, it was 100 points out of 400, which means the proportion of points allocated to listening has increased from one-fourth to one-third of the total points, by decreasing the proportion of vocabulary and grammar.

As described in the previous three paragraphs, a primary concern of the NT is to measure practical communicative competence. The JLPT web site offers the following description:

The JLPT places importance not only on (1) knowledge of Japanese-language vocabulary and grammar but also on the (2) ability to use the knowledge in actual communication. In order to perform various “everyday tasks” that require language, not only language knowledge but also the ability to actually use it are necessary.

Due to large-scale testing, the JLPT employs a multiple-choice testing format, which does not necessarily measure writing and speaking proficiency directly. These proficiencies may only be indirectly assessed through the knowledge test (vocabulary and grammar) and other skill tests. Some question items, which require instant response to dialogs contained in the listening test, seem to be included as an alternative to a speaking test, though only a few aspects of interpersonal speaking skills are covered. In this manner, the new JLPT may also be defined as a member of the family of new proficiency assessment methods focused on communicative competence.

5 Simple Performance-Oriented Test (SPOT)

5.1 What is SPOT?

In this section, I discuss the Simple Performance-Oriented Test (SPOT) as a measure for objectively evaluating the degree of automatic processing ability. Owing to its high reliability and strong correlations with learners' performance on other tests, SPOT is currently widely used for the purpose of placing Japanese learners into levels within language courses, or dividing learners to groups for acquisition research.

SPOT was originally developed as an indirect test measuring ongoing processing ability by Kobayashi and Ford-Niwa (Kobayashi and Ford 1992). SPOT consists of a series of audio recordings of complete sentences read by a native speaker. The test-takers listen to these recordings in parallel with reading the same sentences in Japanese script on the answer sheet. Each sentence on the answer sheet contains a blank space in which the test-takers should write the answer they hear in the audio. Each blank space corresponds to a single *hiragana* syllabary character representing all or a part of grammatical item. Each sentence has a different meaning, and there is no contextual relationship among sentences. Some typical examples are as follows.⁴

- (1) となりの人 () 教えてもらったんです。
Tonari no hito (ni) osiete moratta-n desu.
 Next GEN person DAT explain-GER receive.PAST.NMLZ is.PRS
 'I had the person next to me explain it to me.'
- (2) きのう母にしか () れました。
Kinoo haha ni sik-a(ra)re-masita.
 Yesterday my.mother by scold-PASS-POL.PST
 'I was scolded by my mother yesterday.'

The number of sentences in the test varies from approximately 30 to 60, depending on the version. Ordinarily, several versions of the test are provided, and mostly two or three versions (or 60 to 120 sentences in total) among them are administered corresponding to the range of the test-takers' ability. The sentences are read only once with a two-second pause after each sentence. Since the audio device runs continuously and does not cease during the test, the total testing time, including that for giving instructions, and distributing and collecting the answer sheets, lasts only from 10 to 15 minutes, in the case of a 60 item SPOT, and 15 to 20 minutes in the case of a 120 item SPOT. Checking the answers of SPOT requires minimal effort; typically only one *hiragana* character need be checked in each sentence. Therefore,

⁴ The actual test items are shown in Japanese characters only. In the italicized Romanization, the missing item is included in the parentheses.

no specialized knowledge is required for administering and checking the test, thus making it possible for it to be administered by untrained personnel. Recently SPOT-WEB has been made available for on-line administration, and its results are instantly available following the test. I will later discuss differences between the paper versions and the web versions of SPOT.

5.2 Reliability of SPOT and correlation with other tests

It has been demonstrated that SPOT is a highly effective and reliable instrument as a Japanese placement test. For instance, Hatasa and Tohsaku (1997) conducted statistical analyses of SPOT results at the University of California (UCSD) and the University of Iowa (UI). These researchers concluded that SPOT is highly correlated with other placement tests and with instructors' evaluations of speaking abilities. They also claimed that this conclusion was further supported by the final grades of the course. Similar results were obtained at my own institution, the University of Tsukuba (UT). The reliability of SPOT is illustrated in Table 2 (Ford-Niwa and Kobayashi 1999). It should be noted that SPOT version 3 is edited for beginning and intermediate students, and version 2 is for intermediate and advanced students. Two sets of SPOT data from UT referred to here, one obtained based on the results of version 2 in 1991 and the other, version 3 in 1994, when both tests were administered to all the students from the beginning to advanced levels who were required to take the placement test for their Japanese-as-a-Second-Language (JSL) course. The data obtained at UI were on SPOT version 3 applied to first and second-year students and on version 2 for third and fourth-year students (Hatasa and Tohsaku 1997).

Table 2: Reliability of SPOT (Ford-Niwa and Kobayashi 1999)

Version		Reliability ⁵	n
Version 3 (beginners-intermediate)	60 items	0.95 (UT)	85
		0.95 (UI)	61
Version 2 (intermediate-advanced)	65 items	0.95 (UT)	137
		0.96 (UI)	20

At the time of its administration, the UT placement test consisted of four sections, grammar, listening, reading, and vocabulary and *kanji* script, and all questions were presented in a multiple choice format. UI also administered the UT placement test without vocabulary and *kanji* script. As shown in Table 3, SPOT scores show strong correlations with the total scores of the UT placement test for all versions.

⁵ Reliability was calculated using the Kuder-Richardson Formula 20.

Table 4 illustrates correlations between SPOT and speaking ability at UCSD (Hatasa and Tohsaku 1997). At UCSD, Japanese language learners' oral communicative ability in the target language was ranked by their instructors. SPOT was administered to students whose communicative ability had been ranked. SPOT version 3 was used for first- and second-year students and version 2 for third- and fourth-year students as was done at UI. Iwasaki (2002) also reported that the correlation between SPOT scores and Japanese speaking ability (as measured by an ACTFL-OPI) of English native speakers was .81 ($p < .01$), and stated that this result indicates a potential possibility of using SPOT for measuring language instant production ability.

Table 3: Correlations between SPOT and the UT Placement Test⁶ (excerpt from Ford-Niwa and Kobayashi 1999)

	PT Total	Grammar	Listening	Reading	Vocabulary
Ver. 3 (UT, $n = 85$)	.82	.73	.67	.76	.69
(UI, $n = 61$)	.73	.78	.43	.05	NA
Ver. 2 (UT, $n = 137$)	.82	.81	.75	.69	.61
(UI, $n = 20$)	.92	.77	.61	.48	NA

Table 4: Ranking Correlations between SPOT Scores and Evaluations of Speaking Ability at UCSD (Hatasa and Tohsaku 1997)

Course	Ranking Correlation ⁷
1st Year (Ver. 3, $n = 42$)	.825*–1.000*
2nd Year (Ver. 3, $n = 19$)	.887*–.953*
3rd Year (Ver. 2, $n = 15$)	.770*
4th Year (Ver. 2, $n = 5$)	1.000*

*significant at .01 level

5.3 Theoretical background of SPOT

The format of the SPOT answer sheet appears to be similar to those used for cloze tests (Taylor 1953; Oller and Conrad 1971), the C-test (Klein-Braley 1985; Klein-Braley and Raats 1984), and grammar filling tests in the sense that all of these adopt parenthesized blanks. Unique features of SPOT, therefore, are apt to be misinterpreted by both testers and test takers. While SPOT is different from the other devices mentioned

⁶ Correlations between SPOT and the UT placement test illustrated in Table 3 (excerpt from Ford-Niwa and Kobayashi 1999) are calculated using Spearman's Rank Correlation.

⁷ The range of correlation coefficients for the first and second-year courses is due to the multiple class sections at these levels. (Hatasa and Tohsaku 1997)

in several ways, the most significant feature of SPOT lies in the fact that test-takers have to answer the question in accordance with the real-time speed of sentences being read.

5.3.1 Real-time processing forced by audio-media

As the audio material is recorded at the natural speed of a native-speaker, test takers are required to answer each item in real time as quickly as native speakers would. This stands in sharp contrast to other conventional paper and pencil tests in which test takers usually may take as much time to reread and answer question-items as they like. In other words, the use of audio material requires the test takers to fill in the answers in real time.

Ford-Niwa and Kobayashi (1999) compare and discuss the results of two tests: one using the SPOT answer sheet with no audio-tape and allowing as much time as test takers need, and the other using the same SPOT accompanied by corresponding audio material. The no-audio version was administered to 109 students who had already taken the same SPOT using the audio version (i.e., a normal SPOT) two weeks earlier. The test-taker's scores for the non-audio version were compared with those of the normal SPOT in which high- and low-scoring groups are defined as those comprising the uppermost and lowest 25% of test takers. The analysis shows that the audio material has an opposite effect between the two groups; the audio appears to work to raise the scores of the high scoring group while lowering them for the low scoring group.

Table 5 shows a summary of the test results. In the non-tape version, more than one correct answer may sometimes be possible and the type of available scoring is divided as follows:

- I. The same answers as those of audio-taped SPOT
- II. Alternative answers available in the non-audio test counted as correct
- III. Possible answers in alternate context (less likely to be used) counted as correct

Table 5: Mean Score and SD on SPOT and the No-tape Version (Ford-Niwa and Kobayashi 1999)

Group	Type of Score	SPOT		No-Tape Version	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
High-scoring (<i>n</i> = 27)	I	25.19 (84.0%)	3.37	23.30 (77.7%)	3.99
	II	NA		23.93 (79.8%)	3.90
	III	NA		24.52 (81.7%)	3.82
Low-scoring (<i>n</i> = 27)	I	5.78 (19.3%)	2.39	8.11 (27.0%)	3.46
	II	NA		8.85 (29.5%)	3.60
	III	NA		10.37 (34.6%)	3.41

Table 5 indicates that the score of the high-scoring group is slightly lower on the non-audio version than on the normal SPOT version, although the difference is not statistically significant. The score of the low-scoring group, on the other hand, is much higher on the non-audio version and the difference is statistically significant (Ford-Niwa and Kobayashi 1999).

The practical test time spent for the normal SPOT version (30 items) in this experiment was 2.05 minutes, while the average time for the non-audio version test was 7.48 minutes for the high-scoring group and 15.19 minutes for the low-scoring group. This is apparently due to the fact that the test takers are allowed ample time for the non-audio version, similar to most conventional tests of grammatical knowledge.

The low scoring group scored higher under the condition of sufficient time than on the normal SPOT. This indicates that this group may have been less competitive in processing the question-items in real time on the normal SPOT, regardless of their fundamental linguistic knowledge of question-items. Namely, the learners in the early stages of second language acquisition needed a certain amount of time to process the speech they encounter by controlling their linguistic knowledge consciously. In this context, the fact that the high-scoring group attained almost the same score in the two test types implies the capability of learners in the advanced stages to process in real time. SPOT is a test suitable for measuring the ability of real-time processing and its score reflects the degree of automatization of language processing.

5.3.2 Auditory recognition of one mora (*hiragana*) sound

SPOT is devised to expand the limits of conventional Japanese-language script tests by applying cognitive science in regard to auditory recognition. The recognition of such minute audio units as one mora of *hiragana* is very difficult if such units are singled out from the context of the words in which they appear in the phrases or sentences uttered at natural speed. Even for native speakers, it is extremely difficult to perceive and recognize such an isolated portion of an utterance. Each *hiragana* sound in a natural utterance is frequently pronounced differently from how a single *hiragana* would be pronounced in isolation due to influences such as anticipatory articulation of the surrounding sounds. However, the sound of one mora, which is unperceivable in isolation, can be heard clearly when that sound is merged into the word, phrase, or sentence. The present author has demonstrated this fact to JSL teachers in listening pedagogy classes; when a very short portion of the utterance (e.g., an approximately one-mora unit) is initially played, the majority of the listeners were unable to identify it. Then, when both the preceding and following parts of the unit are gradually expanded and reproduced together, the unit became clearly recognizable since the meaning of the larger chunk becomes apparent. For instance,

the sound *ku* of *tukue* (desk) may be unidentifiable if the *ku* is singled out from the surrounding sounds of the word *tukue*. However, *ku* will become recognizable as *ku* when it is pronounced in the word *tukue*.

We recognize phonetic units by taking advantage of complementary knowledge of sounds between partial units and whole sentences. The particular sound of a certain *hiragana* will be discriminable out of many other probable syllables in the context of its surrounding sentences. We can process phonetic information by calling upon our knowledge of the phonological system, vocabulary, and grammar of the language.

SPOT makes use of this idea of recognition based on knowledge of the phonological system of Japanese, and requires test takers to use the provided audio material in order to write grammatical target consisting of a single *hiragana* in the blank parentheses placed in each question sentence. The target *hiragana* sound is neither erased nor masked by white noise or chime, but rather is left fully audible. Test takers with a lower proficiency level may not recognize the sound although it is made equally available to all test takers through the audio material consisting of the test-item sentences being read out loud by a native speaker.

Spolsky et al. (1968) report on an experimental noise-test administered to native and non-native speakers of English to measure the test-takers' overall language capabilities. The theory of this noise-test originated from the idea that missing portions of sentences (accomplished by the use of a masking-noise) can be restored owing to linguistic redundancy. However, this testing method was little supported due to reasons of both practical difficulty in engineering noise-masking on the testing media at that time and causing test takers to have an unpleasant experience (Johansson 1973).

The background theory of SPOT, on the other hand, lies in the statistical fact that test-takers who are unknowledgeable linguistically cannot perceive the sound of short sound units one mora in length. Therefore, SPOT does not adopt masking-noise as a means of altering a specific portion of the sounds. The high correlation between SPOT and other conventional Japanese-language tests (their total scores in particular) and oral tests was already mentioned in the previous section. This fact indicates that test-takers cannot retrieve single *hiragana* sounds from a fluent audio reading, unless they are able to draw upon an accumulated linguistic knowledge of Japanese.

Some incorrect answers found in the tests indicate interesting decision making by test-takers. The correct answer for (3) is *de*, but the most frequent incorrect answer is *ga*. The correct answer for (4) is *wa*, but the most frequent incorrect answer is *da*. As a characteristic feature, the test-takers answer questions based on their language knowledge, which may be totally irrelevant to the running audio sound. This tendency can be seen in every testing site in a certain percentage of test takers.

- (3) これはうちの問題 () ありまして、そちらには関係のないことです。

Kore -wa uti no mondai (de)ari-masi-te, sotira ni
 This TOP our GEN problem is-Polite-GER, you DAT
wa kankei no nai koto desu.
 TOP connection NOM not thing is.POL.PRS
 'This is our problem but not of your business.'

- (4) 新聞を読んでも本当のことはなかなかわからない () けです。

Sinbun o yon-de-mo hontoo no koto wa
 newspaper OBJ read-GER-but real GEN thing TOP
nanakanaka wakara-nai (wa)ke desu.
 hardly understand-not way is.POL.PRS
 'It makes sense even if we do not understand the truth after reading the
 incident in the newspaper.'

Generally, test-takers of higher language proficiency can easily fill in the parenthesis with their answer while listening to the audio and reading the sentence at the same time. Yet, lower-proficiency test-takers have less capacity to manage the parallel actions of listening and reading and are apt to concentrate their efforts more on identifying the specific sound that should be put in the parenthesis, rather than understanding the overall meaning of the testing sentences. They seem to answer based on their learned knowledge. The above mentioned examples of incorrect answers on question sentences (3) and (4) indicate that they apparently hear *ga aru* 'there is' in spite of the fact that in the actual audio *de aru* appears, and *dake da* 'is only' instead of *wake da*. These typical errors may originate from their past experience in language learning, in which they have learned *ga aru* and *dake da* more frequently in early stages of practice. This tendency coincides with the order of study items appearing in Japanese-language textbooks, as well as the observations of teachers in the field.

In the same sense, Scovel (1998) has shown in his psycholinguistic experiments that English native speakers identify a single-word by inference through listening to a whole sentence. He claims that what we hear is influenced by psycholinguistic variables and is not just the accurate perception of the phonological material that hits our ears. He asked a group of listeners to listen to sentences (5) through (8), below, and to write down the sixth word in each of them:

- (5) It was found that the -eel was on the axle.
- (6) It was found that the -eel was on the shoe.
- (7) It was found that the -eel was on the orange.
- (8) It was found that the -eel was on the table.

The listeners claimed that they heard wheel for sentence (5), heel for (6), peel for (7) and meal for (8), even though the actual sound pronounced in each sentence was *eel*.

This result shows that we do not listen to each sound or each word individually in isolation, but rather build comprehension from the whole discourse. This explanation is the fundamental idea of SPOT. However, unlike Scovel's experiment, in which native speakers invented a most plausible word for each context, even though in each case the same sound was spoken, in the case of SPOT, non-native test takers must rely on their linguistic knowledge in relation to the question-item sentence in order to identify the sounds actually spoken.

5.4 Authenticity and automaticity in language processing

The first impression that most people might get upon glancing at the test sheet (or the screen in case of online testing) of SPOT may be that its format resembles a traditional grammar filling test or a cloze test as previously mentioned. This may seem to be a far cry from the idea of authentic language testing that has recently been advocated. It would not be likely in daily life that test-takers have to listen to a number of incoherent sentences arranged on a sheet with no context or mutual connections among them. Critics of SPOT claim that it lacks authenticity. This is partly true from the viewpoint of task content. However, from the standpoint of language processing, the on-going task of SPOT is authentic.

5.4.1 The construct of authenticity

Authenticity is defined by Bachman and Palmer (1996: 23) as “the degree of correspondence of the characteristics of a given language test task to the features of a TLU task.” Regarding the authenticity of language testing, the present author would like to extract *language processing authenticity* from the general authenticity described by Bachman and Palmer, and to modify their definition as follows: The authenticity of a language test is the degree of correspondence of the characteristics of a given language test task to (1) contextual features of a TLU task's contents and (2) automatic processing features of native speakers' language use.

(1) Task context authenticity

The test authenticity discussed in the preceding studies corresponds mainly to the similarity of the features of the test tasks' context to the real world, such as the test's topical content in a reading test, or the types of tasks in conversation test. In order to improve test authenticity, the issue of language description used in the real world becomes important, (i.e., in what situation [e.g., participants, place, purpose of

communication], using what skills [e.g., reading, speaking], using what kinds of expressions [e.g., grammar, vocabulary]), as well as relevant research on learners' proficiency levels.

(2) Language processing authenticity

The state of language processing in performing a task should be regarded as equally important as the task content. This type of authenticity is recognized in the cognitive aspects of the language use. It is difficult for learners to use a non-native language as fluently as native speakers do. Accordingly it is difficult for them to carry out language processing at the same speed as a native speaker. The language competencies of speaking and listening, in particular, may be of no use to learners in the real world unless they can process the language at the speed of native speakers. Native language users process grammar and vocabulary unconsciously, i.e., they use language automatically with no clear consciousness of controlling grammar (Bialystok and Sharwood Smith 1985). In our daily lives, for instance, we may drive a car while talking with friends, which means that we can easily perform the two actions of driving and talking in parallel, suggesting that we can manage both actions unconsciously (or automatically). Driving would become very dangerous if intentional control were required in the process of driving and/or talking. Automatic and unconscious processing makes it relatively easy for people to perform different tasks in parallel. For example, ordinarily, students at lecture classes can manage taking notes and checking handouts and the screen while they are listening.

5.4.2 Automaticity

As explained in the previous section, SPOT requires test takers to respond at a natural speed, which requires almost automatic as well as unconscious linguistic capabilities (in regard to the ability of automatic processing, see Shiffrin and Schneider 1977, Sharwood Smith 1994). In other words, their linguistic processing capabilities should be at the level of implicit knowledge (Ellis 2005, 2009). A typical example of realizing this capability would be native speakers who, when not in situations calling for special attention to choosing one's words, can manage their conversation with no specific awareness of grammatical rules.

However, most non-native speakers who have not yet reached near-native proficiency would usually manage conversation or produce sentences with a keen consciousness of their grammatical knowledge and vocabulary learned through study. This is especially true in cases when students receive explicit instruction in foreign language in schools, and so forth.

According to Ellis (2009: 3), "cognitive psychologists distinguish implicit and explicit learning and knowledge." Ellis (2005: 143) also states that "there is broad

consensus that the acquisition of an L2 entails the development of implicit knowledge.” How to teach a foreign language effectively as an implicit knowledge should be an important theme for language instructors. The research foci of SLA include whether hard study and practice contribute to make explicit knowledge implicit, and/or whether there exists any means of instruction that works to facilitate the development of implicit knowledge from the beginning. Ellis (2009: 151) summarizes explicit and implicit knowledge as illustrated in Table 6. Based on his definition, implicit knowledge can be accessed through automatic processing, while explicit knowledge can be accessed through controlled processing. Ellis also notes that so-called procedural knowledge belongs to implicit knowledge, and declarative knowledge to explicit. This table clarifies the relationship among terminologies frequently used in the academic fields of cognitive science, language acquisition, and others.

Table 6: Key characteristics of implicit and explicit knowledge (Ellis 2009: 151)

Characteristics	Implicit knowledge	Explicit knowledge
Awareness	Intuitive awareness of linguistic norms	Conscious awareness of linguistic norms
Type of knowledge	Procedural knowledge of rules and fragments	Declarative knowledge of grammatical rules and fragments
Systematicity	Variable but systematic knowledge	Anomalous and inconsistent knowledge
Accessibility	Access to knowledge by means of automatic processing	Access to knowledge by means of controlled processing
Use of L2 knowledge	Access to knowledge during fluent performance	Access to knowledge during planning difficulty
Self-report	Non verbalizable	Verbalizable
Learnability	Potentiality only within critical period	Any age

Ellis (2005) developed a test method as a measuring instrument that distinguishes the interface of the two categories of implicit and explicit knowledge and by which test takers’ capabilities with explicit/implicit knowledge and their inter-changeability can be evaluated. He executed a test battery of five tests to 91 test takers and discussed the results. The five tests are as follows: (1) Imitation, (2) Oral narrative, (3) Timed grammaticality judgment test (GJT), (4) Untimed GJT, and (5) Metalinguistic knowledge. He concluded that tests (1), (2), and (3) measure implicit knowledge whereas tests (4) and (5) measure explicit knowledge. SPOT is similar to test (1) in that questions are answered through listening, and to test (3) in the sense that blank spaces are to be filled with grammatical items in real time (through listening). SPOT

thus measures implicit knowledge, which is strongly related to authentic language processing.

SPOT requires several different simultaneous and instantaneous activities, such as reading, listening, and writing *hiragana* in the parenthesis. Such simultaneous activities are easily conducted when they are automatically done without conscious control. This aspect of language capability is definitely important for daily use of language, since interpretation of information gathered from reading, listening, and/or conversation through the control of the logical circuit of explicit knowledge, and the concomitant delay in response time, would be no use in real life.

Language learners need a considerable amount of practical language experience in order to attain a high level of automatic processing capability. This level, once attained, would become a firm base for enhancing all kinds of skills in speaking, writing, reading, and listening in the Japanese language. Consequently, SPOT can be used as a practical tool to estimate learners' language proficiencies indirectly, as SPOT is expected to yield performance-oriented results, thus obviating the need to perform an authentic performance test (i.e., a task with features similar to real life language use, mentioned by Backman [1990]) directly. Introducing SPOT for proficiency assessment has several advantageous features, like its well-balanced grammatical structure, ease of marking by checking a single *hiragana* character, and its fairness of results, which exclude the kinds of tester subjectivities associated with oral interview tests, as well as low costs in relation to personnel and time.

5.5 Web-based SPOT and future issues

Computer-aided language testing is now becoming popular, and the web-based version of SPOT ("Web-version" below) is currently being prepared for administration on-line. What will it be like when it appears on the web? This section describes in detail how the Web-version is able to measure Japanese-language proficiency nearly as well as the paper SPOT ("P-version" below), which has already been described in the previous sections. In addition, this fact will expand the horizon of SPOT application by using computers, which is another topic of this section.

5.5.1 Difference between the Paper SPOT and Web-SPOT

(1) Presentation of question sentences: In the P-version, all the test question sentences come into the test taker's sight while the audio-reading is in progress. Therefore, test takers are relatively free to read the next sentence, and are able to prepare for answering it if they have already solved the on-going question. A possible drawback, on the other hand, is that they may keep thinking about a difficult unsolved question in spite of the progression of the audio-reading to the next question item,

possibly resulting in a failure to answer the next question as well. In the Web-version, in contrast, only one question appears on the screen at a time, and it disappears in a few seconds. Therefore, test takers are required to answer the question in a certain limited time and are never allowed to revisit past questions.

Another feature of the Web-version is that the same test can be administered on multiple computers with test items appearing in different orders, with the four answer choices also in different orders. That is, each individual test-taker may work on a different question from that of his/her neighbors during the same time. This method of administration apparently contributes to reducing cheating on the test. Such versatility in question ordering will also decrease unwanted effects on each question result. (For instance, working to lessen the effect of absence of attention, which might be caused by weariness in the latter part of the test, or careless mistakes, which are likely to occur at the beginning of the test). Consequently, the Web-version has proven to increase the accuracy of analysis of test results and issues in comparison to the P-version.

(2) Answering Format: The answering format in the Web-version is different from that of the P-version; in the former, test takers are asked to choose and click on one right *hiragana* among 4 choices appearing on the screen, whereas in the later they are asked to write one *hiragana* out of 91 possibilities. In this sense, the level of difficulty appears to be reduced on the Web-version (this issue will be revisited later). Approximately 25% of random clicks by unconfident test takers may hit the correct answer. The availability of only four *hiragana* candidates for any given question may also help test takers to reach the right answer through the process of elimination.

(3) Audio: In the P-version, test takers usually respond all at once to the voice audible from a loud-speaker set up at the test site. On the other hand, on the Web-version, each test taker is equipped with his/her own computer and headphones, which may facilitate listening and higher concentration. The majority of test takers make more favorable comments in regard to the Web-version in comparison to the P-version.

(4) Results processing: Correcting the answer sheets of the P-version is relatively simple, but requires time-consuming labor. In the Web-version, on the other hand, the test results are computed automatically and appear on the screens of both the test takers and the administrator. In addition, the administrator's computer-server has a function for tracing, analyzing, and storing the data of each test taker's answering behavior in detail. For example, raw data, such as which answer item was picked up, and how many seconds were used on each question item, are stored for individual test takers.

5.5.2 Comparison of Test Results of the P-version and the Web-version

The features of the Web-version were summarized in 1) through 4) of the previous section. Kobayashi, Sakai, and Ford-Niwa (2007) compared and analyzed whether

the Web-version is able to measure Japanese language proficiency as well as the P-version. A total of 50 test takers were divided randomly into two groups of 25, Group A and Group B. In the first step, Group A was asked to take the P-version, while Group B was asked to take the Web-version. In the next step these groups were asked to take a reverse test under the same conditions as in the first step. A total of 60 question items, 30 items each from SPOT versions -D and-E⁸, were incorporated into this test. Table 7 summarizes the rate of correct answers and standard deviations for the 60 questions. Figure 1 illustrates a scatter diagram of scores between the two testing schemes.

Table 7: Comparison of the SPOT-WEB and SPOT-Paper & Pencil
60 items (ver. D & E) n = 50

	Means (%)	SD
Paper & Pencil	75.87	26.10
WEB	77.92	20.46

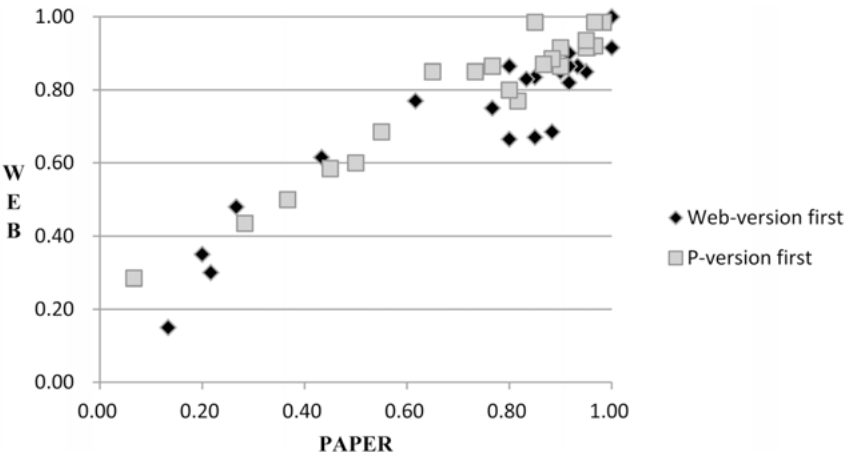


Figure 1: Score distribution on the Web- and P-versions
(Light marks in the figure indicate the scores of Group A (P-version first), and the dark marks those of Group B (Web-version first).

This figure indicates that there is not a large difference in score distribution between the two groups up to the mid score range and below, and that the Web-version seems slightly easier. This scoring tendency implies that the answering system of the Web-version (i.e., selecting one *hiragana* out of four-candidates) may give test takers a better answering condition against harder questions. On the other

⁸ The degree of difficulty of version D (30 items) and E (30 items) are almost the same with the version 2. Version-D consists of spoken Japanese and version-E consists of written Japanese.

hand, in the range of higher scores, it should be noted that the majority of test takers scored relatively higher on the P-version test than on the Web-version. It seems to be easier for them to fill in the answer sheet than to choose an answer from the multiple choices, where only a few seconds are allowed for a response. A *t*-test revealed no significant difference between the mean scores of the P-version and the Web-version ($t = 1.439$, $df = 49$). Kobayashi, Sakai, and Ford-Niwa (2007) concluded that the Web-version is as good and useful as the P-version for measuring test takers' Japanese language proficiencies, as the correlation number of both versions was found to be high (0.94).

5.5.3 Future Application of the Web-version

Applications of SPOT will expand as test conditions like answering-time duration for each question can be set much easier and flexibly by the aid of suitable computer software. When the answering time duration is longer, some features of the original SPOT may be lost, and the test may take on a different character similar to a grammar knowledge test. One of topical features of the Web-version SPOT would give administrators various statistical data necessary to analyze the testing system and scheme in the preparation stage as well as in the test-result processing stages. Therefore, we are now able to see fundamental relations like answering duration times and test taker's learning level, and this feature is expected to expand in the future.

Another possibility for application of the Web-version is to implement the test in silent-mode, in which the administrator is able to observe the test takers' answering-processes of reading sentences on the screen by controlling answering time-duration. Since the software of the Web-version SPOT system is stored in the computer system of the Tsukuba Test-Battery of Japanese (TTBJ), an interested individual can take different kinds of tests other than SPOT through TTBJ, such as tests of grammar knowledge, vocabulary, *kanji* characters, and can-do check lists, among others, while the administrator is able to analyze test takers' language learning profiles through the accumulation of data.

In conclusion, the Web-version SPOT is useful not only as a tool for language administrators to place test takers in a suitable Japanese language level, but also as a research tool for language acquisition researchers to investigate, through accumulation of data in the computer, how learners make progress with their language skills.

6 Conclusion and future possibilities

This chapter has reviewed the historical transition and rationale of language assessment devices ranging from the objective tests of the 1960s, which, being based on structuralism, focused on linguistic knowledge (grammar and vocabulary), to current

tests, which emphasize direct performance measurement. In accordance with this discussion, the JLPT and SPOT were reviewed as tests in practice. I propose to introduce SPOT as a useful tool for evaluate performance ability indirectly by taking advantage of SPOT’s focus on real-time language processes.

It is true that there is no perfect test covering every aspect of language use in the world. I admit at the same time that SPOT has several limitations, such as in evaluating the use of conjunctions that control discourse, or in checking reading ability, and so on. Table 8 summarizes several advantages and disadvantages in applying SPOT for proficiency assessment.

Table 8: Advantages and Disadvantages of SPOT

<cases in which SPOT is useful>	
–	to measure holistic Japanese language proficiency including performance
–	to divide learners whose language abilities vary from lower to higher into 2 to 4 level groups in about 10 minutes.
<cases in which SPOT is not useful>	
–	to check discrete point knowledge and separate language skills
–	to use as an achievement test in the classroom
–	to discriminate test takers at almost the same level

It is also important to emphasize that test takers’ abilities should be evaluated from various angles by applying different types of testing. Brown (1996: 29) stresses that language teachers “must be very careful in their interpretation of test results to remember that performance is only part of the picture – a part that is a second hand observation of competence.” McNamara (2007: 7) also states that “testing is about making inferences; this essential point is obscured by the fact that some testing procedures, particularly in performance assessment, appear to involve direct observation.” There exists no single test that is capable of assessing all aspects of test-takers’ language proficiencies. Therefore, it is possible that the best way is to evaluate them is by means of different tests that are not necessarily perfect in and of themselves, but which have specific features. The various means available, such as tests checking discrete points of linguistic knowledge, tests checking direct performance in the skills of speaking, listening, reading, and writing, tests like SPOT, which measure indirectly performance ability through instantaneous/automatic response, and learners’ self-assessments based on can-do statement lists, should be combined according to the aims of assessment and practical circumstances.

Acknowledgments

I would like to express my sincere gratitude to Masahiko Minami for his useful comments and his patience in having to wait so long. I am also indebted to Jae-ho Lee for his help with the statistical analysis, and to Cade Bushnell for improving my

English grammar. This work was supported by following aids (1) Grant-in-Aid for Scientific Research, The ministry of education, science, sports and culture, Japan. Project number: 07044003. Term of Project: 1995-1997, and (2) Grant-in-Aid for Scientific Research, The Japan society for the promotion of science. Project number: 16320064. Term of Project: 2004-2007.

References

- American Council on the Teaching of Foreign Languages. *ACTFL Proficiency Guidelines 2012*. Retrieved on August 13th 2013 from http://www.actfl.org/sites/default/files/pdfs/public/ACTFL-ProficiencyGuidelines2012_FINAL.pdf.
- Bachman, Lyle F. 1990. *Fundamental considerations in language testing*. Oxford, England: Oxford University Press.
- Bachman, Lyle F. and Adrian S. Palmer. 1996. *Language testing in practice*. Oxford, England: Oxford University Press.
- Bialystok, Ellen and Michael Sharwood Smith. 1985. Interlanguage is not a state of mind: An evaluation of the construct for second-language acquisition. *Applied Linguistics* 6(2). 101–117.
- Bloomfield, Leonard. 1933. *Language*. New York: Henry Holt.
- Brown, James Dean. 1996. *Testing in language programs*. Upper Saddle River, NJ: Prentice Hall Regents.
- Carroll, John Bissell. 1961. Fundamental considerations in testing for English proficiency of foreign students. *Testing the English proficiency of foreign students*. 30–40. Washington, DC: Center for Applied Linguistics.
- Chappell, Carol A. and Roberta G. Abraham. 1990. Cloze method: What difference does it make? *Language Testing* 7(2). 121–146.
- Chomsky, Noam. 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.
- Council of Europe. 2001. *Common European framework of reference for languages: Learning, teaching, assessment*. Council of Europe. Strasbourg, France.
- Ellis, Rod. 2005. Measuring implicit and explicit knowledge of a second language: A psychometric study. *Studies in Second Language Acquisition* 27(2). 141–172.
- Ellis, Rod. 2009. Implicit and explicit learning, knowledge and instruction. In Rod Ellis, Shawn Loewen, Catherine Elder, Rosemary Erlam, Jenefer Philp and Hayo Reinders (eds.), *Implicit and explicit knowledge in second language learning, testing and teaching*, 3–25. Bristol, England: Multilingual Matters.
- Ford-Niwa, Junko and Noriko Kobayashi. 1999. SPOT: A test measuring “control” exercised by learners of Japanese, Kazue Kanno (ed.). *The acquisition of Japanese as a second language*, 53–69. Amsterdam/Philadelphia: John Benjamins.
- Hymes, Dell. H. 1972. On communicative competence. In John B. Pride and Janet Holmes (eds.), *Sociolinguistics: Selected readings*, 269–293. Harmondsworth, England: Penguin.
- Hatasa, Abe Yukiko and Yasu-Hiko Tohsaku. 1997. SPOT as a placement test. In Haruko Minegishi Cook, Kyoko Hijirida, and Mildred M. Tahara (eds.), *New trends and issues in teaching Japanese language and culture* (Technical Report Series, Vol. 15). 77–98. Honolulu: University of Hawaii, Second Language Teaching and Curriculum Center.
- Iwasaki, Noriko. 2002. Nihongo nōryoku shiken (SPOT) no tokuten to ACTFL kōtō nōryokusokutei (OPI) no reberu no kankei ni tsuite [Simple performance-oriented test (SPOT) vs. oral proficiency interview (OPI)]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 114. 100–105.

- Japan Foundation. 2010a. *JF Standard 2010*. Retrieved on June 1st 2014 from <http://jfstandard.jp/>
- Japan Foundation. 2010b. JLPT. Retrieved on June 1st 2014 from www.jlpt.jp
- Johansson, Stig. 1973. An evaluation of the noise test: A method for testing overall second language proficiency by perception under masking noise. *International Review of Applied Linguistics* 11(1-4). 107-134.
- Klein-Braley, Christine. 1985. A close-up on the C test: A study in the construct validation of authentic tests. *Language Testing* 2(1). 76-104.
- Klein-Braley, Christine and Ulrich Raatz. 1984. A survey on the C test-1. *Language Testing* 1(2). 134-146.
- Kobayashi, Noriko and Ford Junko. 1992. Bunpō kōmoku no onseichōshu nikansuru jishshōteki kenkyū. [An Empirical study on aural recognition of grammatical items]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 78. 167-177.
- Kobayashi, Noriko, Takako Sakai, and Junko Ford-Niwa. 2007. Sokutō yōkyū-gata gengo tesuto no web-ka: SPOT-web no baai [A web-based quick response language test: the SPOT-web test]. *CASTEL-J in Hawaii 2007 Proceedings*. 231-234.
- Lado, Robert. 1961. *Language testing: The construction and use of foreign language tests*. New York: McGraw-Hill.
- McNamara, Tim. 2000. *Language testing*. Oxford, England: Oxford University Press.
- Oller, John W., Jr. 1971. Dictation as a device for testing foreign-language proficiency. *English Language Teaching* 25. 254-259.
- Oller, John W., Jr. and Christine Conrad. 1971. The cloze technique and ESL proficiency. *Language learning* 21(2). 185-194.
- Savignon, Sandra J. 1982. Dictation as a measure of communicative competence in French as a second language. *Language Learning* 32(1). 33-47.
- Scovel, Thomas. 1998. *Psycholinguistics*. Oxford, England: Oxford University Press.
- Sharwood Smith, Michael. 1994. *Second language learning: Theoretical foundations*. London, England: Harlow.
- Shiffrin, Richard M. and Schneider, Walter. 1977. Controlled and automatic human information processing; II. Perceptual learning, automatic attending, and a general theory. *Psychological Review* 84(1). 127-190.
- Spolsky, Bernard, Bengt Sigurd, Masahito Sato, Edward Walker, and Catherine Arterburn. 1968. Preliminary studies in the development of techniques for testing overall second language proficiency. *Language Learning* 18, Supplement 3. 79-101.
- Taylor, Wilson L. 1953. Cloze procedure: A new tool for measuring readability. *Journalism Quarterly* 30. 415-433.

Kaoru Koyanagi

8 The role of instruction in acquiring Japanese as a second language

1 Introduction

As an increasing number of foreigners study Japanese all over the world, the demands for professional language teachers and instructional materials have grown to address learners' diversified needs and purposes for learning Japanese. In the past, several researchers (e.g., Kanagy 1991; Nagatomo 1993) voiced their expectations that second language acquisition (SLA) research could enhance the quality of Japanese language pedagogy. However, research on the acquisition of Japanese as a second language (AJSL) had been far behind research on SLA research of other languages such as English and Spanish. This is partly because old tradition of error analysis, in which researchers made lists of error types and classified them, had long dominated the field. Since then, AJSL studies have flourished in the 1990s. Yet most of them, particularly those conducted in Japan, have focused on describing learners' L2 grammar in stages, explaining acquisition patterns at best, while only few studies investigated the effect of instruction on language learning. The-effect-of-instruction research is often associated with a cognitive approach to SLA that explores learners' cognitive processes, such as attention and memory. This approach is of vital importance in order to link SLA research with language pedagogy because understanding how learners learn languages would allow L2 instruction to incorporate appropriate learning processes effectively.

The purpose of this chapter is to explore the status of the-effect-of-instruction research in AJSL. The historical background of this line of research in SLA is briefly discussed first to provide the theoretical framework for this inquiry. Then, the chapter presents a systematic literature overview and meta-analytic review, followed by future directions in AJSL research.

2 Theoretical background for the-effect-of-instruction research in SLA

2.1 The trends in the-effect-of-instruction research

One of the controversial issues in SLA had been whether L2 classroom instruction could lead to SLA, as Krashen (1980) claimed that according to his acquisition/

learning hypothesis, explicit, conscious knowledge learned through conventional grammar lessons would never result in true acquisition that usually occurs in a naturalistic setting where learners receive input from native speakers. This so-called non-interface hypothesis stimulated intense debates over the role of instruction in SLA. Thus, whether L2 instruction could make a difference in SLA became the main issue in the 1980s. Such research revealed that classroom SLA was superior to naturalistic SLA in that L2 instruction helped accelerate the rate of acquisition leading, in turn, to achieving a higher level of proficiency, despite the existence of the universal developmental stages and sequences that L2 instruction was unable to alter (see Doughty 2003; Long 1988 for reviews).

In the 1990s, this line of research focused on identifying the type of L2 instruction that would be more beneficial. The comparative macro-level studies on teaching methods did not find significant differences; thus, operationalizations of instructional techniques at a micro-level need to be more specific. Hence, Long (1991) suggests that learners can benefit from instructional techniques that direct learners' attention to certain linguistic features in a timely manner while retaining the focus on communication, i.e., focus on form (FonF). The contrasted notions, such as focus on formS (FonFS) and focus on meaning (FonM) were also proposed. FonFS means that learners' attention is directed exclusively to linguistic features in an intrusive way, as traditional methods usually do. On the other hand, FonM means that learners' attention is drawn solely to communication, without any focus put on linguistic features (see Doughty and Williams 1998; Robinson and Long 1998 for details). In order to realize FonF, several instructional techniques have been examined in SLA. (e.g., corrective feedback including recasts in which learners' utterances are reformulated with grammatical errors corrected, visual input enhancement in which a certain form is emphasized by underlining and highlighting in the reading texts, input flood in which learners are exposed extensively to input that contains target linguistic features, processing instruction with input processing activities that consolidate the input-intake conversion process, and so forth.

2.2 SLA theories to support the effect-of-instruction research

The validity of FonF has been theoretically discussed from the cognitive view of SLA. For instance, as the interaction hypothesis (Long 1980, 1996) and the output hypothesis (Swain 1985, 1993) suggest, language acquisition is supposed to take place during interaction processes among interlocutors with the aim to get the meaning across (i.e., clarification requests, confirmation checks, comprehension checks, and repetitions). By doing so, learners receive comprehensible input and produce output comprehensible to their interlocutors while interacting also with learners' own internal cognitive mechanisms.

Furthermore, Schmidt's (1990, 2001) noticing hypothesis predicts that it is crucial for learners to notice a certain form in the input as the first step of SLA. Due to his definition of attention and awareness, his earlier version of the noticing hypothesis had often been misinterpreted to suggest that learners should be aware of grammatical rules. Schmidt (2001) then specifically argued that the attention should not be paid to grammatical rules or descriptions, but to surface forms or structures of languages. Krashen's (1980) non-interface hypothesis came under criticism due to his ambiguous definition of consciousness, which is still a broad psychological trait to be tackled in this century; hence, Schmidt was one of the first researchers to shed light on the role of attention played in SLA processes. Robinson (1995, 2003), linking attention with memory, further reformulated "noticing" as "*selective focal attention and rehearsal in working memory* (Robinson 2003: 655)." That is, learners need to detect new information, i.e., a certain linguistic feature, and focus attention on such detected information in order to maintain its activated state in working memory for further processing.

Unlike short-term memory in which information is stored passively for a short period of time, working memory is an active memory that has the dual functions of processing and maintaining information (Baddeley 1986). The central executive subcomponent of working memory controls where to distribute attention within a certain timeline, making it possible to discuss attention and memory together. Language learners process online information in terms of communication performance, and simultaneously detect, maintain, and analyze new information in the input while comparing it to old information activated from their developing L2 knowledge stored in long-term memory. Therefore, Doughty (2001) argued that working memory is a workplace where language processing and language learning take place cognitively, and that noticing is where instructional treatments could intervene by manipulating learners' attention; on the other hand, integration of new information and restructuring of developing L2 knowledge proceeds off-line in learners' mind and is not available for pedagogical interventions.

The notions of FonM/FonF/FonFS to indicate pedagogical techniques are now used to indicate the processing mode, and FonF entails processing form and meaning/function at the same time (Doughty 2001). Usually, people use language for communication; that is, they comprehend language for meaning, and produce language to express messages; thus, FonM is a default processing mode. Learners can easily switch to FonFS on their own, for instance, by referring to grammar books and dictionaries. Switching to FonF from FonM on the part of learners is not so easy; it might be possible, if contexts were clear to learners, and cognitive demands were appropriate for learners' capacity. Yet, such cases are rare; hence, the role of instruction is to help learners to switch FonM to FonF in a timely manner. As discussed so far, this line of SLA research is important and relevant for AJSL as well, because it could contribute to Japanese language pedagogy.

3 Research synthesis and meta-analysis on the effect of instruction in AJSL

3.1 Purpose of the study

More than ten years have passed since Koyanagi (2002) reviewed previous literature on instructed SLA in general and AJSL in particular. During this period, meta-analytic reviews rather than narrative literature reviews have begun to become common practice in SLA (e.g., Lee and Huang 2008; Li 2000; Lyster and Saito 2010; Plonsky and Gass 2011; Russell and Spada 2006; Spada and Tomita 2010), especially after Norris and Ortega (2000) first published their meta-analytic review article on the effectiveness of L2 instruction on SLA; thus, through meta-analytic review, this chapter attempts to synthesize AJSL studies that were concerned with L2 instruction.

In instructed SLA, Norris and Ortega (2000) analyzed the results of the-effect-of-instruction studies published from 1980 to 1998. In order to compare the effect of several instructional techniques, previous studies used statistical analyses such as t-test and ANOVA to find differences between groups. These analyses revealed statistically significant between-group differences (i.e., the experimental group vs. the control group), but did not provide information on the magnitude of the effectiveness of L2 instruction. Studies utilizing larger sample sizes are more likely to find statistically significant differences. Moreover, utilizing different sample sizes across studies prevents one from making meaningful comparison of results across studies. Therefore, in their meta-analysis of the effectiveness of L2 instruction, Norris and Ortega (2000) calculated the “effect size *d*” (Cohen, 1988) for each study to estimate the objective values. In the same manner, an attempt was made to apply this analytic method to synthesize the-effect-of-instruction research in AJSL.

The following research questions are addressed: 1) How has the-effect-of-instruction research been conducted in AJSL to date? 2) What was the magnitude of the effect of instruction on learning Japanese grammatical forms? Since the aim of this chapter is to explore the current status of the-effect-of instruction research in AJSL, the first research question concerns what kinds of AJSL studies in terms of research design have been carried out. After summarizing the characteristics of AJSL studies, the second research question deals with what type of instructional technique would be found to be more beneficial in AJSL, hoping that this analysis would provide some pedagogical implications and future research directions.

3.2 Methods

3.2.1 The literature search and study eligibility criteria

Since I proposed to investigate the-effect-of-instruction research in AJSL, studies published in Japanese as well as those in English from 1990 through July 2012 were

identified through an extensive search of literature. Computer databases such as CiNii (*Citation Information of the National Institute of Informatics*)¹ Articles and LLBA (*Linguistics and Language Behavior Abstracts*)² were utilized, with the keyword combinations such as second language acquisition, learning, Japanese, grammar, focus on form, form-focused instruction, input enhancement, interaction, and feedback. Relevant journals such as *Teaching Japanese as a Foreign Language*, *Acquisition of Japanese as a Second Language (AJSL)*, *Japanese-Language Education around the Globe*, *Language Learning*, *Modern Language Journal*, *Studies in Second Language Acquisition* were manually browsed. I also referred to references in related articles. As a result, more than 25 primary studies were initially retrieved, including those reviewed in Koyanagi (2002). These were further reviewed to assess whether they were relevant for the current meta-analysis. The primary studies identified met the following inclusion and exclusion criteria:

- 1) Studies included in the current meta-analysis had an experimental or quasi experimental design with pretest/posttest measures. Participants in primary studies were L2 learners of Japanese in JSL (Japanese as a Second Language, i.e., in Japan) or JFL (Japanese as a Foreign Language, i.e., outside Japan).
- 2) Studies included examined the effect of specific instructional treatments on the learning of grammatical items; thus, studies involving vocabulary and skills (i.e., reading, learning strategies) were excluded. A study (Samimy 1998) comparing the audio-lingual method and the counseling-learning approach with the scores of the overall achievement tests in different courses was not included for the current meta-analysis. Studies (e.g., Loschky 1994; Iwashita 2006) that used vocabulary measures, in addition to grammar measures, were included, but vocabulary measures were ignored for the current meta-analysis.
- 3) Studies included reported adequate descriptive statistics (namely, means and standard deviations) in order to calculate effect size values. A study (Inagaki and Long 1999) that utilized mean gain scores between the pretest and the posttest was also included because it reported individual mean scores of their participants. Nakae's (2012) and Wei's (2003) studies were excluded due to the lack of sufficient descriptive statistics provided. Studies that investigated the effect of recasts longitudinally with a small number of participants (e.g., Ishida 2004; Iwashita 2010) were excluded. Although several studies that explored recasts (e.g., Egi 2007a, 2007b, 2010; Sugo 2008) were identified, these studies should be excluded because their research purposes were slightly different from the current meta-analysis, as discussed later in the discussion section.

1 CiNii provides a database service that can be searched with academic information of articles, books and journals published in Japan.

2 LLBA abstracts and indexes the international literature in linguistics and related disciplines in the language sciences, covers all aspects of the study of language including phonetics, phonology, morphology, syntax and semantics.

- 4) Studies included compared the experimental group(s) and the control group, or at least one comparison group. However, due to the limited number of primary studies, I included Nakaue's (2009) study that had neither the comparison nor the control group. Her study contributed to the current meta-analysis, since it estimated the effect size values to contrast the pretest and the immediate/delayed posttests in the experimental group. On the other hand, Nakaue (2012), regardless of the improved research design from Nakaue (2009), had to be excluded because standard deviations for each test score were not provided. She graphically presented the results with the mean scores. In addition, a study by Benati and Lee (2010) was excluded because their sample size was too small for statistical analysis (only 3 participants in the control group).
- 5) When multiple articles from one single study, only one study was referred to such as Nagata and Swisher' (1995) study was considered the same study as Nagata (1993); Koyanagi (1998) was the same as Koyanagi (1999); Long, Inagaki and Ortega (1998) was the same as Inagaki and Long (1999); Iwashita (2003) was the same as Iwashita (2006).

Through this search and review procedures, 14 study reports were considered relevant for the current analysis. Three of them (Inagaki and Long 1999; Lee and Benati 2007; Nakaue 2009) used the same experimental procedures for two different target forms. It was decided that the effect size values should be calculated separately, since grammatical natures of target forms could mediate the effect of instructional treatments, as DeKeyser (1995) pointed out. Thus, 17 unique study samples contributed to the effect size calculation.

3.2.3 Coding of primary studies

After identifying the relevant literature that met the eligibility criteria, a coding scheme was developed to specify common characteristics of these primary studies. Several coding procedures were piloted and revised to obtain a comprehensive understanding of characteristics of primary studies. The primary studies were examined in terms of learner characteristics and research design features as summarized in Table 1. Learner characteristics to be considered were sample size, educational context, academic status, learners' proficiency level, and learners' first language (L1). Among these attributes, learners' proficiency levels were difficult to determine, since most of the studies described institutional status such as academic semester/year, in terms of hours of classroom instruction that participants received prior to the experiment. In addition, it is often the case that beginning and intermediate levels are perceived differently in JSL and JFL. For instance, second-year Japanese, which is occasionally named as "Intermediate Japanese" in the U.S., is regarded as still beginning-level Japanese. Therefore, referring to academic status and instructional

materials provided in the experiments, equivalents of N4 and N5 grades in the Japanese Language Proficiency Test (JLPT), the largest scale test of Japanese for foreigners administered semiannually by the Japan Foundation, were regarded as beginning-high and beginning-low, respectively.

As for the research design features, independent variables were the types of L2 treatment, the operationalizations of which were based on Norris and Ortega (2000) and Doughty (2003). The types of L2 treatments were analyzed in terms of the explicitness and processing mode of L2 treatments. Explicit treatment implies that metalinguistic explanation is provided, or that learners are directed to a certain form, and expected to induce rules. Thus, although Koyanagi (1999) considered her drill group as implicit because rule explanations were not provided, this experimental group was coded as explicit, based on Norris and Ortega's (2000) classification, because of inductive nature of instruction. The other feature of the types of L2 treatment was the processing mode derived from the taxonomy proposed by Long (1991), i.e., FonM, FonF, and FonFS. Doughty (2003: 267) further clarified this distinction. FonM implies an "*exposure to L2 targets or experience with L2 tasks, but no attempts to attend forms.*" FonF is an "*integration of forms and meaning,*" more specifically, any of the following should be realized in the treatment: (a) designing tasks that promote engagement with meaning prior to form; (b) seeking task essentialness/naturalness of L2 forms; (c) ensuring unobtrusiveness; (d) documenting L2 mental processes (e.g., noticing); (e) selecting target forms by analysis of learner needs; (f) considering IL (interlanguage) constraints. FonFS does not satisfy any of the above-mentioned conditions (a) through (d).

In the-effect-of-instruction research, dependent variables assess to what extent learners learn/acquire a certain grammatical form. Outcome measures include metalinguistic, interpretation (selected response), constrained production, and free production categories. The metalinguistic category includes grammatical judgment or discrete-point grammar tests (e.g., supplying particles or verb forms in the parentheses, combining two sentences to form a relative clause). Constrained production requires participants to complete the sentences with the dependent clause provided, for instance. Other research design features, such as sampling, length of treatment, timing of the pretests, the immediate posttests, the delayed posttests, and methods for statistical analyses, were also coded to examine whether the experimental procedures were designed appropriately. The coding scheme is summarized in Table 1.

3.3 Results of research synthesis

To address the first research question, I examined the 14 published articles according to the established coding categories to obtain a comprehensive picture of the characteristics of the studies. When Norris and Ortega (2000) conducted their meta-analytic review, they retrieved 49 articles among those published from 1980 to 1998,

most of which were published in the 1990s. Hence, comparing the number of articles, the body of AJSL literature is considerably small. When Lee and Huang (2008) conducted their meta-analysis on the effectiveness of visual input enhancement, they identified 16 studies, stating that visual input enhancement research was still a young field. Keep in mind that findings on the-effect-of-instruction in AJSL research were very limited; however, an attempt was made to clarify the existing status of AJSL research and discuss suggestions for future research.

Table 1: Coding scheme

Coding category	Classifications
<Learner characteristics>	
Sample size	number of participants by study, by group
Educational context	Japanese as a Second Language (JSL), Japanese as a Foreign Language (JFL)
Academic status	university, high school, adult language school
Learners' proficiency level	beginning-low, beginning-high, intermediate-low
Learners' L1	English, Chinese etc.
<Research design features>	
Type of instructional treatment	explicit/implicit, FonM/FonF/FonFS
Sampling	random sampling, intact classes
Length of instructional treatment	brief ($x < 1$ hour), short ($1 \text{ hour} \leq x < 3 \text{ hours}$), medium ($3 \text{ hours} \leq x < 6 \text{ hours}$), long ($6 \text{ hours} \leq x$)
Outcome measures	metalinguistic (grammatical judgment, fill-in-the-blank, etc.), interpretation, constrained/free production
Timing of the pretest	when to conduct the pretest prior to the experiment
Timing of the immediate posttest	when to conduct the immediate posttest after the treatment
Timing of the delayed posttest	when to conduct the delayed posttest after the treatment
Statistical analysis	<i>t</i> -test, ANOVA, ANCOVA

3.3.1 Learner characteristics

A total of 460 participants in the 14 unique sample studies were involved in the current meta-analysis, most of which were conducted in the JFL context, specifically, in the U.S., and only two studies were conducted in the JSL context. Thus, learners' L1s were mostly English or bilingual of English and other languages. The mean number of participants per study and per group (experimental/control) were 32.86 and 13.43, respectively. Compared to SLA research in European languages, the

sample size in the AJSL tends to be small. (For example, Spada and Tomita (2010) reported 58.66 as the mean number of participants in a single study of SLA.) This might reflect the availability of participants in institutions where data was collected. While in most studies participants were recruited from universities, those in three studies came from adult language schools. As to learners' proficiency levels, 85.7% of the participants were considered beginners. In teaching Japanese as a second/foreign language, beginning-level textbooks concentrate on basic grammar. Focus shifts from grammar to reading as learners' proficiency advances; thus, it is highly likely that the AJSL research has targeted beginning-level learners. Learner characteristics are summarized in Table 2.

Table 2: Summary of learner characteristics

Sample size	Total number of participants: 460 per study: <i>Mean</i> = 32.86, <i>SD</i> = 14.92 (<i>n</i> = 16) per group: <i>Mean</i> = 13.43, <i>SD</i> = 6.37 (<i>k</i> = 35)
Educational context	JSL: 14.3% (<i>n</i> = 2), JFL: 85.7% (<i>n</i> = 12)
Academic status	university: 78.6% (<i>n</i> = 11), adult language school: 21.4% (<i>n</i> = 3)
Learners' proficiency level	beginning-low: 50% (<i>n</i> = 7), beginning-high: 35.7% (<i>n</i> = 5), intermediate-low: 7.1% (<i>n</i> = 1), not reported: 7.1% (<i>n</i> = 1)
Learners' L1	English: 78.6% (<i>n</i> = 11), Chinese: 14.3% (<i>n</i> = 2), Italian: 7.1% (<i>n</i> = 1)

3.3.2 Research design

The 14 reviewed studies involved 35 experimental/control groups. Overall, 60% (*n* = 21) of the experimental groups received explicit-type treatment, whereas 22.9% (*n* = 8), were implicit. The types of instructional treatments are summarized in Table 3. In most studies that adopted an explicit approach, grammatical explanations were provided at the beginning of the treatment sessions, followed by practice. Since participants were beginning-level learners, teachers as well as students were concerned with grammatical rules in learning Japanese. Even though processing mode was FonM or FonF, explicit approach was utilized. Nevertheless, FonFS tends to be explicit, whereas FonF is often associated with an implicit approach. Implicit FonF groups were those in which learners received corrective feedback, namely, recasts.

Eleven out of the 14 primary studies adopted an experimental design, that is, random sampling to assign participants to experimental/control groups, whereas three were quasi-experimental studies using intact classes. The instructional treatments used in the primary studies targeted a wide range of grammatical forms, such as particles, locative construction, noun modifications, aspect marker (*V-te*

Table 3: The types of instructional treatments³ used in the primary studies

Explicitness	Processing mode	<i>n</i>	Total
Explicit	FonM	1	21 (60%)
	FonF	6	
	FonFS	14	
Implicit	FonF	7	8 (22.9%)
	FonFS	1	
Control		6	6 (17.1%)

imasu), passive, and causative, among others as shown in Table 4. These forms were considered the rules of basic grammar of Japanese, and thereby, most of the participants were selected from beginning-level Japanese classes. The target forms were chosen based on Japanese researchers/instructors' judgment that certain grammatical forms were difficult to acquire when newly introduced in class. In some studies, linguistic or SLA theories motivated the choice of target forms.

For instance, Koyanagi (1999) chose one of the conditionals “*to*” as the target form, based on Inaba's (1993) study that applied the Transfer Hypothesis (White 1989) to the acquisition of Japanese conditionals. The Transfer Hypothesis predicts that if L1 forms a superset grammar and L2, a subset of grammar, negative transfer is likely to occur unless negative evidence is provided. Conditionals in Japanese (*to*, *tara*, *ba*) are subject to a time sequence restriction such that an event described in the conditional clause should occur prior to an event described in the main clause, whereas this is not the case in English.

- (1) *Huyu ni naru to, yuki ga furimasu.*
winter LOC become COND snow NOM fall
‘When/Whenever winter comes, snow will fall.’
- (2) *Nihongo wo benkyoo suru to, nemuku narimasu.*
apanese ACC study do COND sleepy become
‘When/Whenever I study Japanese, I become sleepy.’
- (3) **Kyooto ni iku to, tuma o turete ikimasu.*
Kyoto LOC go COND wife ACC accompany-go
‘When I go to Japan, I’ll take my wife with me.’

³ The classification is based on Norris & Ortega (2000) as described in 3.2.3 in this paper. Although FonFS are likely to be explicit, implicit FonFS may be possible, e.g., when correct models are provided without rule explanation. In the same vein, although implicit FonF such as recast is advocated, previous research has often been utilized explicit FonF, e.g., providing metalinguistic feedback during communicative practice.

Inaba (1993) showed that L1 English learners needed negative evidence to acquire conditionals in Japanese, and thus, classroom instruction could play an important role in providing negative evidence that is not evidently available in naturalistic acquisition environments. In addition, Inaba (1991) demonstrated that the difficulty of applying the conditional “*to*” can be attributed to a modality restriction that predicates in the main clause cannot express volition, desires, requests, commands, suggestions and so on, whereas this does not apply to conditionals in English.

- (4) *Haru ni naru to, sakura ga sakimasu.*
 Spring LOC become COND cherry blossoms NOM bloom
 ‘When/Whenever spring comes, cherry blossoms bloom.’
- (5) **Haru ni naru to, pikunikku ni iki-tai desu.*
 Spring LOC become COND picnic LOC go-want
 ‘When spring comes, I want to go for a picnic.’

These two studies motivated Koyanagi (1999) to examine the effect of instruction on the acquisition of the conditional “*to*.” Another study (Nakaue 2009) chose causative construction as the target form that is affected by the first noun principle (VanPatten 2002), which means that learners tend to use a default processing strategy to interpret the first noun encountered in a sentence or utterance as the agent of the verb. Nakaue argued that instruction could serve to prevent learners from utilizing this processing strategy, which is not relevant to comprehending causative sentences in Japanese.

Concerning the length of the instructional treatment, the selected studies were coded as brief ($x < 1$ hour), short ($1 \text{ hour} \leq x < 3$ hours), and medium ($3 \text{ hours} \leq x < 6$ hours). Overall, 21.4% of the studies were brief, 21.4% were short, and 57.2%, were medium. Considering Norris and Ortega’s (2000) finding that approximately three hours of instruction had a positive effect, more than half of the primary studies in AJSL provided a sufficient amount of treatment. As for the timing of pretests and posttests, pretests were administered 3.5 days ($SD = 3.79$, $n = 10$) prior to the treatments among 10 studies which reported the timing. Some studies (e.g., Nagata 1993, 1998) used the results of the achievement tests in regular classes to assign participants to groups using stratified random sampling, and then performed paired *t*-test. The pretests were given at such a short-term interval that there might be a danger that learners learn from tests, or notice the target of instruction beforehand. The immediate posttests were administered on the same day following instructional treatments, or within one to two days after the treatments in 11 of the primary studies that reported the timing of the immediate posttests. Eight of the primary studies carried out delayed posttests, while five of them did not. One study (Iwashita 2006) investigated a long-term effect in the experimental group only, and did not report

Table 4: Characteristics of instructional treatments

Study	Treatment Condition	Explicit/ Implicit	Processing Mode	Target Form	Length of Treatment
Nagata (1993)	1) CALI with metalinguistic feedback	Explicit	FonFS	particles,	medium
	2) CALI w/o feedback* (locating errors only)	passive Explicit	FonFS	perfective	
Loschky (1994)	1) negotiated interaction	Implicit	FonF	locative construction	short
	2) premodified input	Implicit	FonF		
	3) Control (baseline input)*				
Nagata (1996)	1) CALI with metalinguistic feedback	Explicit	FonFS	particles (<i>ga, o, ni, de, wa</i>)	medium
	2) Workbook instruction*	Explicit	FonFS		
Nagata (1997)	1) CALI with meta-linguistic feedback	Explicit	FonFS	particles (<i>ni, o, ga, de wa, to</i>)	medium
	2) CALI with English* translation feedback	Explicit	FonFS		
Nagata (1998)	1) Input-based CALI* (selected response)	Explicit	FonFS	honorifics (regular/irregular verb forms)	medium
	2) Output-based CALI (typing a sentence)	Explicit	FonFS		
Inagaki & Long (1999)	1) Recasts	Implicit	FonF	A. adjective ordering B. locative	brief
	2) Models	Implicit	FonF		
	3) Control (no instruction)* construction				
Koyanagi (1999)	1) Input-based tasks	Explicit	FonF	conditional (<i>to</i>)	medium
	2) Input + Output-based tasks	Explicit	FonF		
	3) Pattern practice	Explicit	FonFS		
	4) Control (no instruction)*				
Moroishi (1999)	1) Communicative tasks + grammar explanation	Explicit	FonF	conjectural auxiliaries (<i>-yô da, -sô da -rashii, daroo</i>)	medium
	2) Communicative tasks	Implicit	FonF		
	3) Control (no instruction)*				
Kondo-Brown (2001)	1) Explanation + mechanical output practice	Explicit	FonFS	verbs of giving & receiving	brief
	2) Explanation + structured output practice	Explicit	FonF		
	3) Explanation + structured input practice	Explicit	FonF		
	4) Control (explanation only)*				

Table 4: (Continued)

Study	Treatment Condition	Explicit/Implicit	Processing Mode	Target Form	Length of Treatment
Mukouyama (2004)	1) Grammar-based communicative + grammar explanation	Explicit	FonFS	noun modifications	short
	2) Grammar-based communicative*	Implicit	FonFS		
Iwashita (2006)	1) NS-NNS dyads (information gap tasks, feedback)	Implicit	FonF	locative particles <i>V-te imasu</i>	brief
	2) Control (free conversation)*				
Lee & Benati (2007)	1) Structured input (processing instruction)	Implicit	FonF	A. affirmative /negative present tense form	medium
	2) Traditional instruction (explicit information + mechanical output practice)*	Explicit	FonFS	B. past tense form	
Yabuki-Soh (2007)	1) Explicit form-based	Explicit	FonFS	relative clauses	medium
	2) Meaning-based communicative, inductive)*	Explicit	FonM		
	3) Mixed (form-based + meaning-based) (explanation provided to all)	Explicit	FonFS		
Nakaue (2009)	1) Processing Instruction (explanation + structured input) (No comparison/control group)	Explicit	FonF	A. causative B. passive	short

N.B. * indicates the control or comparison group to be used when calculating effect size values.

the timing. Delayed posttests were administered 34.1 days ($SD = 21.07$, $n = 8$) after instruction.

As for outcome measures, most of the studies, except Inagaki and Long (1999) and Iwashita's (2006) studies that explored the effect of recasts during interaction, used more than one measurement as dependent variables. The 14 primary studies adopted 32 outcome measures, of which 37.5% used metalinguistic, 28.1% used interpretation, 9.4% used constrained production, and 25% used free production. Free production measures assumed to tap learners' implicit knowledge (i.e., spontaneous production) were used alone in Inagaki and Long (1999) and Iwashita (2006), or in the combination of other measures in Koyanagi (1999), Moroishi (1999), and Mukouyama (2004). In finding statistical significances between groups, the primary studies performed ANOVA (50%), followed by t test (35.7%) and ANCOVA (14.3%).

3.4 The quantitative meta-analysis

To address the second research question that concerns the magnitude of effectiveness of different types of instructional treatments on learning of grammar in AJSL research, effect size d values (Cohen 1988) were calculated from each unique sample study. Since not all the studies involved true control groups (i.e., no treatment), experimental groups were compared with those that were the least attention-focused groups, or baseline comparison groups. Individual effect size values were calculated for all possible independent variables and all possible dependent variables. If more than one dependent variable was used, effect size values were averaged to balance the impact of treatments across studies. Except for Nakaue (2009) who did not have a control/comparison group, effect size values of 15 unique sample studies were estimated in order to contrast the treatment group with the control/comparison group at the time of the immediate posttest and the delayed posttest. Since a limited number of studies had true control groups, the results of the comparison between treatment groups and comparison groups should be interpreted with caution. Hence, pretest-immediate posttest, and pretest-delayed posttest contrasts were also calculated for all possible independent variables, including control/comparison groups. Nakaue's (2009) data was included in this analysis, whereas Nagata's (1993, 1996, 1998) that used the course achievement test scores as the pretest, and Loschky's (1994) data that did not provide descriptive statistics on the pretest, were excluded.

Effect size d values of instructional treatments for the Posttests I (immediate posttests) and II (delayed posttests) are summarized in Tables 5. Effect sizes can be interpreted as small $\geq .20$, medium $\geq .50$, and large $\geq .80$ (Cohen 1988). It is shown that overall, the magnitudes of instructional treatments were quite large in AJSL research. Norris and Ortega (2000) presented the magnitudes of effectiveness of instructional treatments as follows:

explicit FonF > explicit FonFS > implicit FonF > implicit FonFS > FonM

The same order can be applied to this current meta-analysis. Table 6 shows the pretest-to-posttest contrasts for all the groups involved. Superiority of explicit instruction prevailed as well. In particular, the effectiveness order from explicit FonF to explicit FonFS to implicit FonF was evident in this meta-analysis. Norris and Ortega (2000) and Doughty (2003) pointed out methodological problems in previous studies. They emphasized that only few studies investigated implicit instruction, that many outcome measures used in these studies favored explicit instruction, and thus that, implicit knowledge, i.e., spontaneous production was not sufficiently tested. The same is still true of AJSL research, even though more than 10 years have passed since Norris and Ortega (2000) published the first meta-analytic review of SLA. In addition to the methodological problems, few studies investigated long-term effects; thus, whether instructional treatments have long-lasting effects is unclear. Given all these factors, the results obtained in the current meta-analysis should be inconclusive and interpreted with caution.

Table 5: Average effect size *d* values of instructional treatments (Posttests I & II)

Treatment type	<i>k</i>	<i>Mean</i>	<i>SD</i>	95% CI range	95% CI lower	95% CI upper
Posttest I						
Explicit	14	1.08	0.58	± 0.30	0.78	1.38
Implicit	11	0.77	0.57	± 0.64	0.13	1.41
FonF	16	1.01	1.01	± 0.49	0.52	1.50
FonFS	9	0.82	0.42	± 0.27	0.55	1.09
Explicit FonF	5	1.38	0.26	± 0.23	1.60	2.06
Implicit FonF	11	0.77	0.57	± 0.64	0.13	1.41
Explicit FonFS	9	0.82	0.42	± 0.27	0.55	1.09
Posttest II						
Explicit	10	0.83	0.39	± 0.24	0.59	1.07
Explicit FonF	5	1.13	0.25	± 0.22	0.91	1.35
Explicit FonFS	5	0.53	0.25	± 0.22	0.31	0.75

4 Discussion

4.1 The status and problems in AJSL research

In the context of the-effect-of-instruction research in SLA that has related language learning to learners' cognitive mechanisms, I reviewed primary studies in AJSL. Although a limited number of studies investigated AJSL, the studies that I examined revealed similar results to those reported by Norris and Ortega (2000) more than one decade ago. AJSL research found that instructional treatments had been, overall, beneficial for learning Japanese as a second language, and the superiority of explicit instruction over implicit instruction had been evident. In order to meet the demand for AJSL research, which could contribute to Japanese language pedagogy, it is necessary to improve and enhance existing research design. These issues are discussed in the following section.

First, most of the studies were conducted within the JFL context; thus, evidence of the effectiveness of instructional treatments should be established also for the JSL context. Studies in both contexts have strengths and weaknesses. In the JFL context, researchers carry out empirical studies that are situated in a broader context of advanced SLA theories in the U.S. and Europe. Since the exposure to the target language is limited to the classroom, it is relatively easy to control intervening variables. Nevertheless, it is quite difficult to find advanced learners, because language instruction in the JFL context proceeds at a slower pace compared to that in the JSL context. On the other hand, learners at various levels, from beginning to advanced, are available in the JSL context, although it is difficult to control for all the intervening variables attributed to factors outside the classroom, such as the

Table 6: Average effect size *d* values of instructional treatments (Pretest-to-Posttest contrasts)

Treatment type	<i>k</i>	<i>Mean</i>	<i>SD</i>	95% CI range	95% CI lower	95% CI upper
<u>Pretest-to-Posttest I</u>						
Explicit	17	2.68	1.25	± 0.59	2.09	3.27
Implicit	10	2.13	2.96	± 1.83	0.30	3.96
FonF	16	2.55	2.44	± 1.23	1.32	3.78
FonFS	10	2.31	1.38	± 0.83	1.48	3.14
Explicit FonM	1	(2.73)				
Explicit FonF	8	2.74	1.29	± 0.89	1.85	3.63
Implicit FonF	9	2.25	3.12	± 2.04	0.21	4.29
Explicit FonFS	9	2.63	1.25	± 0.82	1.81	3.45
Implicit FonFS	1	(1.04)				
Control	7	0.54	0.42	± 0.31	0.23	3.45
<u>Pretest-to-Posttest II</u>						
Explicit	8	1.50	0.32	± 0.22	1.28	1.72
Implicit	4	0.66	1.06	± 1.04	−0.38	1.70
FonF	8	1.45	0.50	± 0.35	1.10	1.80
FonFS	4	1.12	0.21	± 0.21	0.91	1.33
Explicit FonF	5	1.68	0.20	± 0.18	1.50	1.86
Implicit FonF	3	0.56	1.28	± 1.45	−0.89	2.01
Explicit FonFS	3	1.18	2.98	± 0.24	0.94	1.42
Implicit FonFS	1	(0.94)				
Control	3	0.69	0.51	± 0.58	0.11	1.27

availability of native speakers, hours of exposure to the target language, L1 backgrounds, and previous learning experiences, among others. Accordingly, it is worth conducting empirical studies because a large number of foreigners study Japanese in Japan. Methodological problems can be solved, for instance, by assigning participants with different backgrounds equally to the comparison groups through stratified sampling. Replication studies with the same research design, but in different contexts would become more important than before. When evidence sufficiently accumulates in different educational contexts, in JSL as well as in JFL, strong claims about the effectiveness of a certain type of instruction could be made and pedagogical implications could be drawn.

In relation to this, most primary studies reviewed recruited beginner students as participants. This is partly because basic grammar is the main target of instruction in beginning Japanese, and most data were collected in JFL where institutions have much more beginner learners than advanced learners. Nevertheless, complex grammatical forms, such as particles *wa* (topic marker) and *ga* (subject marker) are difficult even for intermediate or advanced learners to acquire. Hence, AJSL research

needs to carry out experiments with intermediate or advanced learners. In addition, a common problem to both the JSL and JFL contexts is that the sample size per group and per study was small. However, it may be due to the availability of learners in educational institutions where data was collected. Additionally, this problem could also be solved by using a simple research design. According to Norris and Ortega (2000), a simple research design is recommended to minimize the influence of the confounding variables that could obscure the effect of instructional treatment on learners' acquisition. Therefore, Norris and Ortega suggested that one study should have one experimental group and one control group. Two contrast groups in one study are encouraging for AJSL research which lacks abundant participants.

Furthermore, the most serious problem in AJSL research is that the implicit mode of learning is not sufficiently investigated, as Doughty (2003) claimed for instructed SLA in general. FonFS investigated in AJSL tended to be explicit, incorporating an instructional treatment in combination of conventional grammar exercises or pattern practice with the provision of metalinguistic explanations. This might be associated with teachers/researchers' concern or belief that learning grammatical rules would be essential to learning Japanese, which is a completely different language from learners' L1s. While metalinguistic knowledge serves to enhance the likelihood of noticing in the subsequent input (Tomlin and Villa 1994), there seems to be no evidence that metalinguistic knowledge itself would result in SLA (Doughty 2003; Hulstijn 2002). Thus, implicit FonF should be further investigated.

Recently, several researchers (e.g., Hulstijn 2002; Robinson 2003; Segarowitz 2003) have introduced the Principle of Transfer Appropriate Processing (Morris, Bransford and Franks 1977) to SLA. According to this view derived from memory research in cognitive psychology, better performance would be achieved if the way in which people process information through memorizing coincides with the way in which they process information through testing. If this principle could be applied to SLA, it would suggest that learners who receive explicit FonFS would show the best performance in discrete-point grammar tests, whereas those who receive implicit FonF would display the best performance in spontaneous production test. As the research domain currently defined in AJSL shows, explicit FonFS was beneficial for learners of Japanese; yet, implicit FonF has been explored to a limited extent thus far in AJSL research. In addition to improving in instructional treatments, outcome measures of SLA need to be reconsidered.

4.2 Future directions

One of the important issues that future AJSL research needs to address is the implicit mode of learning. In fact, recasts that are one type of implicit corrective feedback have been frequently investigated in AJSL, although most studies on recasts were not included in the meta-analysis because they did not adopt an experimental

design with pretest/posttest measures. Recasts are considered implicit corrective feedback through which learners' erroneous utterances are reformulated by interlocutors (mostly teachers or more proficient learners) while maintaining the meaning that learners want to express. This technique is promising since recasts never hinder a natural flow of communication in the classroom. Recasts can provide negative evidence, in that reformulations indicate that something is wrong with learners' utterances, and positive evidence, in that reformulations serve to offer correct models for learners (Leeman 2003).

(6) Example of Recast (Egi, 2010: 10)

(NNS: nonnative speaker, NS: native speaker)

NNS **Megane o a, ka, kakemasu.*
glasses ACC wear
'(She) wears glasses.'

NS *Obaasan wa megane o kakete-imasu ka?* ← Recast
old lady TOP glasses ACC wear-progressive Q
'Is the old lady wearing glasses?'

NNS *Kakete-imasu.*
wear-progressive
'(She) is wearing glasses.'

An intense debate over recasts in instructed SLA is that recasts might be too implicit and ambiguous for learners to interpret as negative feedback (Lyster and Ranta 1997). It may be possible for learners to perceive recasts as another way of expressing the same meaning. Thus, learners' perceptions about corrective feedback including recast were investigated in the Japanese language classroom (Wei 2002; Yoshida 2010) and in one-on-one sessions (Sugo, 2008). Egi (2007a, 2007b, 2010) further examined what types of recasts, depending on target forms, location of reformulations, and the like could be accurately interpreted as corrective feedback by learners. Future research should adopt an experimental design to compare the treatment groups, which receive recasts intensively with the control group, and with pretest/posttest measures in order to confirm whether recasts will lead to SLA. Since implicit learning requires longer hours for SLA to happen, as research on implicit learning in cognitive psychology suggests (Stadler and Frensch, 1998), empirical studies should implement intensive recasts for a certain amount of time.

In order to discuss the effect of instructional treatments on SLA, cognitive mechanisms such as attention and memory should account for acquisition processes. This scientific approach pursues universality of SLA processes and mechanisms, while these mechanisms also reflect individual differences. In particular, working memory plays a crucial role in language processing and learning, but learners are different in

their capacity and speed to process information in working memory (Robinson 2002). Thus, the effect of instruction could interact with learners' individual differences, namely, language aptitude. An attempt has already been made to link the effectiveness of classroom instruction with individual differences of learners. For instance, Mukouyama (2004) found that grammatical explanation incorporated into meaning-based activities was more beneficial in the low-proficiency group than in high-proficiency group. Mukouyama (2009a) further investigated the role of language aptitude in L2 learning that is supposedly composed of language analytic ability, phonological short-term memory, and working memory capacity (Skehan 1998). Her results confirmed Skehan's (1998) claim that phonological short-term memory is more important at an initial stage of acquisition, whereas working memory becomes more crucial at a later stage. Moreover, language analytic ability is constantly important throughout L2 learning. Mukouyama (2009b) also examined the same data using cluster analysis and showed that high language analytic ability could complement weak phonological short-term memory. Mukouyama's (2009a, b) studies on language aptitude, which traced learners' L2 development over one year and half in the same institution, did not have an experimental design. In SLA, Robinson (2002) argued that the effects of instruction could be maximized if learners' profile of language aptitude matched a certain type of treatment. Robinson provided a theoretical framework to specify the association of language aptitude with type of instruction. Hence, in AJSL research, the next step would be to conduct an empirical study that would investigate the effectiveness of a certain instructional technique, with data on learners' language aptitude combined.

Finally, to discuss the significance of AJSL research, the contribution to the entire field of SLA should be considered. To say nothing of adding supporting or counter evidence to the-effect-of-instruction research in SLA where most evidence has accumulated in European languages, AJSL research can make a unique contribution to the field. As Koyanagi (2002) argued, FonF, that is, simultaneous processing of form and meaning/function, is even more crucial in Japanese because according to Kuno and Kaburaki (1977) and Takubo (1997), for example, Japanese is an agglutinative language that expresses attitudes toward events or viewpoints of the speaker morphosyntactically using indirect passive and modality expressions, whereas such viewpoints are often expressed by adverbs or inserted phrases in English. Therefore, introducing forms in meaningful contexts is especially significant for Japanese language pedagogy, and this is what FonF intends to realize.

Furthermore, learners of Japanese whose L1s are typologically different from Japanese might be burdened with cognitive limitations of language processing and learning processes that they have never experienced in their L1s. According to the bilingual language production model proposed by de Bot (1992, 1996), L2 learners need to automatize language processing procedures unique to L2, although fundamental mechanism of language processing procedures are common to any language. De Bot suggested that what is unique to L2 lies in the message formulation stage

prior to verbalizing messages. At this stage, while macro planning in which the goal of communication is set proceeds, micro planning in which communicative intentions are further elaborated occurs, and is regarded as language-specific. Hence, learners of Japanese need to incorporate the speaker's viewpoint (or attitude toward events) into message planning. This procedure is involved with working memory. Osaka, Osaka, and Groner (2000) implied that working memory capacity is stable regardless of L1 or L2; yet, L2 learners of low proficiency are unable to use working memory as efficiently as L1. Thus, an efficacy level of working memory in L2 would affect the micro planning process. The "viewpoint" of speakers has been investigated in Japanese linguistics, but further research in SLA is needed from the cognitive perspective.

5 Conclusion

This chapter aimed to synthesize the-effect-of-instruction research in AJSL. Although a body of literature in AJSL is limited, the studies that investigated the types of instructional treatments were available. According to the current meta-analysis, overall, explicit instruction (FonF and FonFS) has the largest effect on AJSL, but methodological problems need to be solved in future research. Since the speaker's viewpoints or attitudes toward events are expressed at a morphosyntactic level in Japanese, FonF that intends to process form and meaning/function at the same time, could be much more important in Japanese than in other European languages. This needs further investigation. This line of research is meaningful in AJSL, and it could contribute to Japanese language pedagogy.

References

- Baddeley, Alan. 1986. *Working memory*. Oxford: Oxford University Press.
- Benati, Alessandro G., & Lee James F. 2010. Exploring the effects of processing instruction on discourse-level interpretation tasks with the Japanese passive construction (with Hikima, Noriko). In Alessandro G. Benati and James F. Lee (eds.), *Processing instruction and discourse*, 148–177. London: Continuum International Publishing Group.
- Cohen, Jacob. 1988. *Statistical power analysis for the behavioral sciences*. Second edition. New York: Psychology Press.
- De Bot, Kees. 1992. A bilingual production model: Levelt's 'speaking' model adapted. *Applied Linguistics* 13: 1–24.
- De Bot, Kees. 1996. The psycholinguistics of the output hypothesis. *Language Learning* 46: 529–555.
- DeKeyser, Robert M. 1995. Learning second language grammar rules: An experiment with a miniature linguistic system. *Studies in Second Language Acquisition* 17: 379–410.

- Doughty, Catherine. 2001. Cognitive underpinnings of focus on form. In Peter Robinson (ed.), *Cognition and second language instruction*, 207–157. Cambridge, UK: Cambridge University Press.
- Doughty, Catherine. 2003. Instructed SLA: Constraints, compensation, and enhancement. In Catherine J. Doughty and Michael H. Long (eds.), *Handbook of second language acquisition*, 256–310. Malden, MA: Blackwell.
- Egi, Takako. 2007a. Interpreting recasts as linguistic evidence: The roles of linguistic target, length, and degree of change. *Studies in Second Language Acquisition* 29: 511–537.
- Egi, Takako. 2007b. Recasts, learners' interpretation, and L2 development. In Alison Mackey (ed.), *Conversational Interaction in Second Language Acquisition: A Collection of Empirical Studies*, 249–268. Oxford: Oxford University Press.
- Egi, Takako. 2010. Uptake, modified output, and learner perceptions of recasts: learner perception as awareness. *Modern Language Journal* 94: 1–21.
- Hulstijn, Jan. H. 2002. Toward a unified account of the representation, processing and acquisition of second language knowledge. *Second Language Research* 18: 193–223.
- Inaba, Midori. 1991. Semantic domains and interlanguage structure in second language acquisition of Japanese conditionals: The case of native speakers of English. *Journal of Japanese Language Teaching* 75: 87–99.
- Inaba, Midori. 1993. Subset principle vs. transfer hypothesis: Can L2 learners disconfirm superset grammar without evidence? *JACET Bulletin* 23: 37–56.
- Inagaki, Shunji and Long, Michael H. 1999. Implicit negative feedback. In Kazue Kanno (ed.) *The acquisition of Japanese as a second language*, 53–70. Amsterdam: John Benjamins.
- Ishida, Midori. 2004. Effects of recasts on the acquisition of the aspectual form *-te i-(ru)* by learners of Japanese as a foreign language. *Language Learning* 54: 311–394.
- Iwashita, Noriko. 2003. Negative feedback and positive evidence in task-based instruction: Differential effects of L2 development. *Studies in Second Language Acquisition* 25, 1–36.
- Iwashita, Noriko. 2006. Does NS feedback in NS-NNS conversation facilitate SLA? *Acquisition of Japanese as a Second Language* 9, 42–62.
- Kanagy, Ruth. 1991. *Developmental sequences in the acquisition of Japanese as a foreign language: The case of negation*. Unpublished Ph.D. dissertation. University of Pennsylvania.
- Kondo-Brown, Kimi. 2001. Effects of three types of practice in teaching Japanese verbs of giving and receiving. *Acquisition of Japanese as a Second Language* 4: 82–115.
- Koyanagi, Kaoru. 1998. The effect of instruction on the acquisition of conditionals. *Acquisition of Japanese as a Second Language* 2: 1–26.
- Koyanagi, Kaoru. 1999. Differential effects of focus on form vs. focus on forms. In T. Fujimura, Y. Kato and R. Smith (eds.), *Proceedings of the 10th conference on second language research in Japan*, 1–31. International University of Japan.
- Koyanagi, Kaoru. 2002. Focus on form and Japanese acquisition research. *Acquisition of Japanese as a Second Language* 5: 62–96.
- Krashen, Stephen. 1980. The input hypothesis. In James Alatis (ed.), *Current issues in bilingual education*, 168–180. Washington DC: Georgetown University Press.
- Kuno, Susumu and Etsuko Kaburaki. 1977. Empathy and syntax. *Linguistic Inquiry* 8: 627–672.
- Lee, James F. and Alessandro G. Benati. 2007. The effects of structured input activities on the acquisition of two Japanese linguistic features. In James F. Lee and Alessandro G. Benati (eds.) *Delivering processing instruction in classrooms and in virtual contexts: Research and practice*, 49–71. London: Equinox.
- Lee, Sang-Ki and Hung-Tzu Huang. 2008. Visual input enhancement and grammar learning: A meta-analytic review. *Studies in Second Language Acquisition* 30: 307–331.
- Leeman, Jenifer. 2003. Recasts and second language development: Beyond negative evidence. *Studies in Second Language Acquisition* 25: 37–63.

- Li, Shaofeng. 2010. The effectiveness of corrective feedback in SLA: A meta-analysis. *Language Learning* 60: 309–365.
- Long, Michael H. 1980. *Input, interaction and second language acquisition*. Unpublished Ph.D. dissertation. University of California, Los Angeles.
- Long, Michael H. 1988. Instructed interlanguage development. In Leslie Beebe (ed.), *Issues in second language acquisition: Multiple perspectives*, 115–141. Rowley, MA: Newbury House.
- Long, Michael H. 1991. Focus on form: A design features in language teaching methodology. In K. de Bot, D. Coste, C. Kramsch and R. Ginsburg (eds.), *Foreign language research in crosscultural perspective*, 39–52. Amsterdam/Philadelphia: John Benjamins.
- Long, Michael H. 1996. The role of the linguistic environment in second language acquisition. In William C. Ritchie and Taj K. Bhatia (eds.), *Handbook of second language acquisition*, 413–468. San Diego, CA: Academic Press.
- Long, Michael, H., Shunji Inagaki and Lourdes Ortega. 1998. The role of implicit negative feedback in SLA: models and recasts in Japanese and Spanish. *Modern Language Journal* 82: 357–371.
- Long, Michael H. and Peter Robinson. 1998. Focus on form: theory, research, and practice. In Catherine Doughty and Jessica Williams (eds.), *Focus on form in classroom second language acquisition*, 15–41. Cambridge, UK: Cambridge University Press.
- Loschky, Lester. 1994. Comprehensible input and second language acquisition: What is the relationship? *Studies in Second Language Acquisition* 16: 303–323.
- Lyster, Roy and Leila Ranta. 1997. Corrective feedback and learner uptake: Negotiation of form in communicative classroom. *Studies in Second Language Acquisition* 19: 37–66.
- Lyster, Roy and Kazuya Saito. 2010. Oral feedback in SLA: A meta-analysis. *Studies in Second Language Acquisition* 32: 265–302.
- Moroishi, Mariko. 1999. Explicit vs. Implicit learning: Acquisition of the Japanese conjectural auxiliaries under explicit and implicit conditions. In N. O. Jungheim and Peter Robinson (eds.) *Pragmatics and Pedagogy: Proceedings of the 3rd Pacific Second Language Research Forum*, Vol. 2, 217–230. Tokyo: PacSLRF.
- Mukouyama, Yoko. 2004. The effect of explicit formal instruction in a meaning-based lesson on the acquisition of Japanese noun modifying clauses. *Acquisition of Japanese as a Second Language* 7: 100–120.
- Mukouyama, Yoko. 2009a. Contribution of language aptitudes to second language learning: Roles of language analytic ability, phonological short-term memory, and working memory. *Japanese Linguistics (Nihongo Kagaku)* 25, 67–90.
- Mukouyama, Yoko. 2009b. Comparison between success in L2 learning and aptitude profiles by cluster analysis. *Acquisition of Japanese as a Second Language* 12, 66–85.
- Morris, C. Donald, John D. Bransford & Jeffery J. Franks. 1977. Levels of processing versus transfer appropriate processing. *Journal of Verbal Learning and Verbal Behavior* 16, 519–533.
- Nagata, Noriko. 1993. Intelligent computer feedback for second language instruction. *Modern Language Journal* 77: 350–339.
- Nagata, Noriko. 1996. Computer vs. workbook instruction in second language acquisition. *CALICO Journal* 14: 53–75.
- Nagata, Noriko. 1997. The effectiveness of computer-assisted metalinguistic instruction: A case study in Japanese. *Foreign Language Annals* 30: 187–200.
- Nagata, Noriko. 1998. Input vs. output practice in educational software for second language acquisition. *Language Learning and Technology* 1: 23–40.
- Nagata, Noriko and Virginia M. Swisher. 1995. A study of consciousness by computer: The effect of metalinguistic feedback on second language learning. *Foreign Language Annals* 28: 337–347.
- Nagatomo, Kazuhiko. 1993. Japanese interlanguage studies: An overview. *Journal of Japanese Language Teaching* 81: 1–18.

- Nakaue, Aki. 2009. The effects of processing instruction on the acquisition of causative construction and humble expressions in Japanese. *Bulletin of the Graduate School of Education, Hiroshima University, Part II, Arts and Science Education* 58: 245–252.
- Nakaue, Aki. 2012. Comparative studies of processing instruction and output-based instruction in Japanese adjective comparison. *Journal of Japanese Language Teaching* 151: 48–62.
- Norris, M. John and Lourdes Ortega. 2000. Effectiveness of L2 instruction: A research synthesis and quantitative meta-analysis. *Language Learning* 50: 417–528.
- Osaka, Mariko, Naoyuki Osaka and Rudolf Groner. 2000. Working memory and L2 language processing: The results of bilingual reading span tests. In Osaka Naoyuki (ed.), *Brain and working memory*, 243–254. Kyoto: Kyoto University Press.
- Plonsky, Luke and Susan Gass. 2011. Quantitative research methods, study quality, and outcomes: The case of interaction research. *Language Learning* 61: 325–366.
- Russel, Jane and Nina Spada. 2006. The effectiveness of corrective feedback for the acquisition of L2 grammar: A meta-analysis of the research. In John M. Norris and Lourdes Ortega (eds.), *Synthesizing research on language learning and teaching*. Amsterdam/Philadelphia: John Benjamins.
- Robinson, Peter. 1995. Attention, memory and ‘noticing’ hypothesis. *Language Learning* 45: 283–331.
- Robinson, Peter. 2002. Learning conditions, aptitude complexes and SLA: A framework for research and pedagogy. In Peter Robinson (ed.), *Individual differences and instructed language learning*, 112–131. Amsterdam/Philadelphia: John Benjamins.
- Robinson, Peter. 2003. Attention and memory during SLA. In Catherine Doughty and Michael H. Long (eds.), *Handbook of second language acquisition*, 631–678. Malden, MA: Blackwell.
- Samimy, Keiko Komiyama. 1998. A Comparative study of teaching Japanese in the audio-lingual method and the counseling-learning approach. *Modern Language Journal* 73: 169–177.
- Schmidt, Richard. 1990. The role of consciousness in second language acquisition. *Applied Linguistics* 11: 129–158.
- Schmidt, Richard. 2001. Attention. In Peter Robinson (ed.), *Cognition and second language instruction*, 3–32. Cambridge, UK: Cambridge University Press.
- Segalowitz, Norman. 2003. Automaticity and second language learning. In Catherine Doughty and Michael H. Long (eds.), *Handbook of second language acquisition*, 382–408. Malden: MA: Blackwell.
- Skehan, Peter. 1998. *A cognitive approach to language learning*. Oxford: Oxford University.
- Spada, Nina and Yasuyo Tomita. 2010. Interactions between types of instruction and type of language feature: A meta-analysis. *Language Learning* 60: 263–308.
- Stadler, Michael and Peter A. Frensch. 1998. *Handbook of implicit learning*. Thousand Oaks, CA: Sage.
- Sugo, Sachie. 2008. Inappropriate utterances of Japanese benefactives by upper intermediate and advanced-level learners of Japanese, and their responses to corrective feedback: A comparison between recasts and feedback to elicit repairs. *Journal of Japanese Language Teaching* 139: 52–61.
- Swain, Merrill. 1985. Communicative competence: some roles of comprehensible input and comprehensible output in its development. In Susan Gass and Carolyn Madden (eds.), *Input in second language acquisition*, 235–253. Rowley, MA: Newbury House.
- Swain, Merrill. 1993. The output hypothesis: Just speaking and writing aren’t enough. *Canadian Modern Language Review* 40: 158–164.
- Takubo, Yukinori. 1997. *Shiten to gengo kōdō* [Viewpoints and verbal behavior]. Tokyo: Kurosio Publishers.

- Tomlin, Russell S. and Victor Villa. 1994. Attention in cognitive science and second language. *Studies in Second Language Acquisition* 16: 183–204.
- VanPatten, Bill. 2002. Processing instruction: An update. *Language Learning* 52: 754–803.
- Wei, Mariko Moroishi. 2002. Recasts, noticing and error types: Japanese learners' perception of corrective feedback. *Acquisition of Japanese as a Second language* 5: 24–41.
- Wei, Mariko Moroishi. 2003. Learning simple and complex rules: Acquisition of Japanese locative particles and conjectural auxiliaries. *Nihongo Kagaku* [Japanese Linguistics] 14: 54–72.
- White, Lydia. 1989. The adjacency condition on case assignments. Do learners observe the Subset Principle? In Susan M. Gass and Jacqueline Schachter (eds.), *Linguistic perspectives on second language acquisition*, 134–158. Cambridge, UK: Cambridge University Press.
- Yabuki-Soh, Noriko. 2007. Teaching relative clauses in Japanese: Exploring alternative types of instruction and the projection effect. *Studies in Second Language Acquisition* 29: 219–252.
- Yoshida, Reiko. 2010. How do teachers and learners perceive corrective feedback in the Japanese language classroom? *Modern Language Journal* 94: 293–314.

Masahiko Minami

9 The influence of topic choice on narrative proficiency by learners of Japanese as a foreign language

1 Introduction

Language is at the center of our lives. In everyday life, all of us routinely engage in narrative activities. We tell stories to one another in order to accomplish some purpose – to complain, to disagree, to boast, to inform, to warn, to tease, to clarify, to apologize, or to defend, among others. Our stories can be about trivial events that happened only yesterday or about significant events that happened long ago. Ordinary storytelling, which is a frequently used and universal form of social interaction, is of undiminished importance whether we narrate in our mother tongue or in a second or foreign language (L2). Conveying messages effectively, however, is sometimes difficult even in the first language (L1), and, of course, this difficulty increases when we attempt to communicate in an L2. While acquiring the ability to use language at the level of native speakers is the ultimate goal for L2 learners, en route to that goal we face various difficulties because we do not possess the skill level in that language necessary to effectively complete a narration task. Highly advanced L2 learners may be capable of constructing grammatically correct utterances, but significant differences between the language used by L2 learners and that of native speakers often still exist. For L2 learners, communicating even simple thoughts successfully is a challenging task, and telling personal narratives that involve a higher level of complexity is still formidable. So we face the question of how L2 learners come to eventually acquire the necessary communication skills to narrate their experiences effectively.

This chapter examines aspects of two disciplines: (1) second language acquisition and (2) narrative discourse. First, implementation of newer theories of L2 acquisition has helped language instructors develop more effective teaching methods than the explicit grammar and vocabulary approach used in traditional foreign-language classrooms (e.g., Ohta 2001). Grammar-translation teaching that stresses explanations of grammatical rules or points derives, at least in part, from the idea that L2 learning involves the conscious acquisition of a catalogue of knowledge. Language learners' difficulties conveying their messages in the target language, however, seem, in fact, to relate to a lack of interactional competence. Such competence is achieved through repetitive interactions with peers and teachers within the classroom setting. Unfortunately, the importance of such pragmatic interactive practice is often not emphasized in traditional classrooms.

Second, narrative, the verbal means for recapitulating experience, composed of units that reflect the temporal sequence of that experience (Labov 1997, 2006), is used across all languages and cultures. The construction of narrative involves not only attribution of meaning to otherwise disconnected events, but also includes highly subjective uses of language that provide context to the narrated events, so that the narrator can foster a complex discursive relationship with the listener.

In this sense, as William Labov, the sociolinguist who pioneered eliciting oral personal narratives, emphasized, the narrator relies on affective expression as a primary means of conveying the relational significance of narrative events. From this insight, Labov (1972) succeeded in shifting a linguistic paradigm from isolated linguistic forms (i.e., syntax or the grammatical sentences of a language) to linguistic form in human context, and analyzed the sequential use of language (i.e., discourse). The study conducted by Labov and Waletzky (1967) was based on narratives of near-death experiences drawn from 600 interviews conducted with African American adolescents and adults who were speakers of African American Vernacular English (AAVE). Labov described fundamental properties of narrative structure and the linguistic realizations of those structural categories. One of his major contributions was identifying a universal set of ordered structural categories through a systematic analysis of everyday oral narratives (Labov 1972, 2013). An especially important element of Labov's contribution lies in his claim that analyzing single sentences is inadequate for a complete explanation of the wide variety of linguistic skills across a range of ages, social classes, and ethnicities.

Yet a structural description of narratives derived from a single speech community (in this case a community of AAVE speakers) is too limited for any assumption of universality. Labov's assertion of universality opened up new avenues of inquiry in narrative analysis that have been applied widely to narratives from diverse groups by providing a basis for cross-cultural (e.g., Kang 2003, 2006) and developmental comparisons (Peterson and McCabe 1983). In fact, a great number of narrative studies derive from Labov's work, in which he defined a narrative text as "a sequence of two clauses which are temporally ordered" (Labov 1972: 360). He also analyzed stories in terms of textual composition.

Labov claimed that a narrative consists of two essential functions: the referential and the evaluative. According to Labov, one referential component is "complicating actions", Labov's term for the sequence of specific, chronologically ordered events comprising the experience. Another important referential component is orientation, in which the narrator digresses from the events of a narrative in order to provide the listener with context embedded in the narrative, such as the setting (including features of environment), participants, time, conditions, and ongoing behavior (a description of an ongoing action that provides additional orientation). Without feelings and attitudes, narrated events would be mere representations of the facts in our

lives. Evaluative elements give additional meaning to narrated events. The evaluative function informs the listener of the narrator's attitude toward the events of the narrative or the event's significance to the narrator.

In any case, telling a story involves many complicated factors, among which we may include whether the story is told in the narrator's L1 or in an L2. Unfortunately, far less work using Labov's technique has been conducted on L2 learners. Designed to address some of these gaps in the literature, this study analyzes oral personal narratives told by adult learners of Japanese as a foreign language (JFL). For instance, by applying narrative analysis to L2 learning, we seek to uncover techniques needed for L2 learners to acquire the means by which to encode their own perspectives and emotions in the target language in ways appropriate to that language. Using a combination of the above two disciplines – narrative studies and second-language studies –, this study compares the deployment of narrative discourse devices by advanced and intermediate JFL learners.

As explained above, using the Labovian content-focus approach (Labov 1972), this study analyzes personal narratives told in Japanese by Japanese-language learners. The study specifically examines the following key questions: Absent specific instruction in narrative techniques, (1) Do the structures of narratives told by JFL learners change as their Japanese skills develop? (2) Do the structures of narratives told by JFL learners differ depending on the narrative topic? Answering these questions is important because foreign language teaching is often limited to grammar and vocabulary and does not include lessons and practice in verbal communication. As a result, L2 learners may employ communicative styles appropriate to their L1 when telling stories and thus have significant difficulties conveying their intended messages in the target language. Language instructors may have good reason for emphasizing grammatical competence in their classrooms, but discourse-level problems seem too often to go unnoticed in the course of language instruction. The fact that L2 learning grows out of communication is important. Social interaction is regarded as the means by which knowledge of the target language is shaped; language learners acquire grammatical patterns during the course of face-to-face discursive interaction. Including this important method of language acquisition will assist learners in effective L2 communication (Ohta 2001).

2 Method

2.1 Participants

Thirty-two English-speaking adults (twenty-one males and eleven females) participated in this study. English is the mother tongue of all the participants. All the participants had studied Japanese as a second or foreign language through classroom

instruction. The average length of time studying Japanese (which included individual tutoring and/or independent or self-study) was 3 years and 3 months. We elicited natural, unmonitored, informal speech by using the so-called danger-of-death or scary event story that was originally developed in Labov's sociolinguistic research (Labov 1972). JFL learners were asked to talk about (1) an injury-related experience and (2) an early childhood memory.

2.2 Task, procedure, and materials

2.2.1 Evaluation of oral personal narratives produced by JFL learners

The JFL learners were categorized into two different *proficiency* levels – intermediate and advanced – by four native Japanese speakers who participated in this project as raters of the learners' level of proficiency in Japanese. Each of the four raters independently listened to the tape-recorded narratives told by each of the JFL learners. The narratives had been edited onto a single audiotape in random order so as to preserve the anonymity of the speakers. The raters indicated how advanced each JFL learner was in each of the following three categories: (1) grammatical aspects (whether or not the narrator made frequent grammatical errors), (2) oral fluency (pronunciation, accent, and speed), and (3) story content (whether the story was easy to follow, clearly understandable, and interesting). The raters were asked to score each narrative with a level from 1 (lowest) to 10 (highest) in each category. A perfect score was 120 (level 10 in each of the three categories by four raters). To help ensure fair results, the examiners were allowed to listen to the narratives only once (repeated listening might cause the raters to develop biased images about the narrator).

2.2.2 Transcription and coding categories

The narrative data were transcribed verbatim by native Japanese speakers who had been trained to use the coding rules previously developed for Japanese data by Minami (2002). Transcripts were then formatted following the guidelines of Codes for the Human Analysis of Transcripts (CHAT), so that they were readable by the computer program Computerized Language Analysis (CLAN) (MacWhinney 2000; MacWhinney and Snow 1985, 1990). A coding scheme has been developed using the Labovian methodology (Labov 1972, 1997) to interpret the data focusing on the content of each clause in monologic narrative from the standpoint of high point analysis (i.e., the narrative event is considered to culminate in a high point of some kind), a term used by Peterson and McCabe (1983) because of the central importance

of ascertaining the emotional climax – high point – of the narrative in the Labovian methodology.

2.2.3 Coding reliability

Nine full transcripts were coded independently by two individuals. Cohen's kappa is an estimate of reliability that corrects for chance agreements among raters. As for the categories of narrative components of the JFL learners' narratives (which include orientation, complicating action, and evaluation, and these will be explained in detail in the results section), Cohen's kappa statistics were .89 for the injury-related experience and .91 for the early childhood memory. If the degree, or relative strength, of agreement as measured with kappa statistics is between .61 and .80, it is labeled "substantial" agreement; further, if the range of kappa is over .81, it is considered to represent "almost perfect" agreement (Bakeman and Gottman 1997; Landis and Koch 1977). In this case, the estimates of reliability for each story fall into the range of "almost perfect" agreement. Additionally, the coders negotiated a resolution of all disagreements.

3 Results

3.1 Native Japanese speakers' ratings

The ratings of the narratives by native Japanese speakers were then analyzed. The overall distributions and frequencies of the results ranged from 35 to 106 ($M = 72.97$, $SD = 22.15$). As can be seen in Figure 1, which illustrates a bimodal distribution of the results, the JFL learners could be rationally divided into two groups at around the score of 75. Those who obtained a score of 75 or higher were considered to be in the advanced group, whereas those who obtained a score lower than 75 were categorized into the intermediate group.

3.2 Oral personal narratives

Labov (1972) proposes a six-part structure of fully formed oral narrative: abstract, orientation, complication (complicating action), evaluation, resolution, and coda. A typical narrative starts with an abstract ("What, in a nutshell, is this story about?"). The narrative then proceeds to the orientation section (information about "who, when, where, and what?"). The function of the orientation segment is to orient the listener at the outset to "person, place, time, and behavioral situation". The narrative then proceeds to the apex – high point – including any complicating actions ("Then

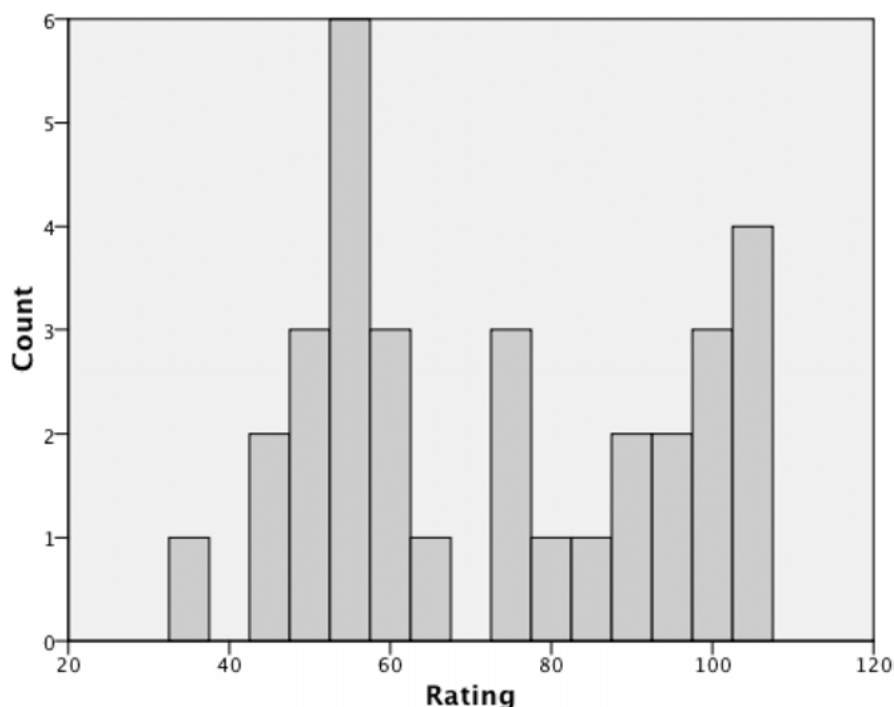


Figure 1: Distribution of evaluations of JFL learners by native Japanese speakers

what happened?”). Frequently, but not always, the evaluation (“So what, how is this interesting?”) suspends the action, and the resolution (“What finally happened”) comes followed by the coda (“That’s it,” which signals the *sealing off* of the narrative), which is represented by a comment that returns the listener(s) to the situation prevailing when the narrative was initiated. Labov’s analytical framework has provided a sound basis for descriptive and comparative research on narrative structure. The components that he identified have weathered extensive use for a great number of researchers for their various purposes in a wide variety of disciplines, including child language research (e.g., Peterson and McCabe 1983).

Some modifications are indicated, however. For example, orientation clauses that acquaint the listener with “who and what was involved in the event” do not contain any temporal component, and can therefore range relatively freely throughout the narrative sequence. Because the orientation segment constitutes a group of free narrative clauses (as opposed to restricted narrative clauses, which are represented by complicating actions that recapitulate a single event that took place at some discrete or restricted point in time), contrary to Labov and Waletzky’s (1967) claim, the orientation segment does not necessarily precede the first narrative clause. Accordingly, as explained below, the present study, while retaining the Labovian methodology overall, included minor modifications.

As the data collection method followed the Labovian technique, the coding scheme employed for this analysis also followed the Labovian methodology (Labov 1972, 1997), in that it focused on the content of each clause in the personal narrative. Although other analytic units had been proposed by different scholars in the past, Labov and Waletzky (1967) also adopted the clause for their analyses. According to Labov (1972), a narrative consists of two important elements: referential and affective (or evaluative). The referential elements, which convey information about events and characters, are further categorized into two components: complicating action and orientation. Complicating action depicts the sequence of specific, chronologically ordered events comprising the experience, whereas orientation, unlike specific action, provides descriptive non-sequential information, setting the stage for the narrated events, such as information about people, place(s), time(s), and situation(s). In other words, complicating action gives plot-advancing foreground information, whereas orientation provides contextualizing background information of the story (Hopper and Thompson 1980). Evaluative elements, which also provide background information, convey the narrator's attitudes toward events and his or her interpretations of the protagonists' motives and reactions to events. To begin with, remembering is a subjective event (Ochs and Capps 1997). Without evaluation, a story told by the narrator would have an empty feel. Following Labov (1972: 366), evaluation contained in narratives is "the means used by the narrator to indicate the point of the narrative, its *raison d'être*: why it was told, and what the narrator is getting at." Evaluation is thus a structure of a different kind than the normative sequential structure that Labov described for restricted narrative clauses, namely, complicating actions (Wortham 2000).

Reported speech (statements that generally reproduce the speech of a character) was added to the analysis. Reported speech is an important category because it is considered a linguistically marked recounting of a past speech event (Ely and McCabe 1993; Gwyn 2000). Labov's (1972) six-fold characterization of overall narrative is nothing but the cognitive representation of reality imposed by narrative structure on our experience of the world and on how we evaluate that experience. Bruner's (1986) view of narrative structure is analogous to landscape painting consisting of two major landscapes: the landscape of action and the landscape of consciousness. The narrator "paints" the latter to show "how the world is perceived or felt by various members of the cast of characters, each from their own perspective" (Feldman et al. 1990: 2). Reported speech sets us thinking about narrative not simply as a form of text, but as a mode of thought.

As will be seen later in the examples of reported speech, the persons quoted by the narrators probably spoke English and not Japanese, but narrators perforce reported their statements in Japanese. Narratives may contain numerous references to past speech, but such references are *selected* by the narrator and thus reflect the narrator's intent. Furthermore, what is reported in narratives may not accurately convey past speech. The narrator's decision to use reported speech and the words

actually used to simulate that speech portray the narrator's concept of him or her as a certain type of individual. As Tannen (2007: 104–105) notes, “the reported speech and the reporting context are dynamically interrelated” and “uttering dialogue in conversation is as much a creative act as is the creation of dialogue in fiction and drama.” Remembering, after all, is a subjective event, and even reported speech, which often seems to lend objectivity to narration, characterizes this fact. That is, the specific narrative feature of evaluation is not only embedded in the continuous acts of description that constitute a narrative, but it is also inserted as well in the second-order evaluations provided by reported speech (Gwyn 2000).

In this study the Labovian category of resolution is not included. As repeatedly emphasized, the Labovian interpretation of narrative centers around the critical importance of ascertaining the emotional climax – the high point – for evaluating the narrative as a whole (Peterson and McCabe 1983). Because resolution can also be coded as another complicating action or evaluation or combination of both that comes after the climax, it is not included in the coding categories in this study.

3.3 Qualitative analysis

To track the way in which learners' narrative abilities develop as well as to determine whether they can utilize narrative devices effectively, both qualitative and quantitative analyses were performed. The following is an outline of the principal elements of simple narratives that perform both referential and evaluative functions:

Narrative is typically considered a text in which the narrator relates a series of events – real or fictive – in the order in which they happened. Narratives include both foreground and background information as categorized by Hopper (1979). Foreground information refers to the parts of the narrative that relate a sequence of events with respect to a timeline and thus define the skeletal structure of the narrative. In contrast, background information refers to supportive narrative, including orientation statements, which present static descriptions of the scene, and evaluation statements, which describe the agent's motives. Recall the criteria for evaluating JFL learners used by native Japanese speakers. The second category, which includes “the flow of the story”, relates to plot-advancing, sequential “foreground” information, whereas “clarity in terms of introducing characters and settings” in the third category relates to the plot-motivating, contextualizing, non-sequential “background” information of the story. Furthermore, foreground information (Hopper 1979; Hopper and Thompson 1980; Reinhart 1984), which corresponds to complicating actions in the Labovian categorization (Labov 1972), refers to the parts of the narrative that relate a sequence of events with respect to a timeline and thus constitutes the “narrative skeleton” of restricted narrative clauses. On the other hand, background information basically corresponds to what Labov (1972) termed free narrative clauses that include orientation and evaluation.

Examples of the important narrative components (which were elicited in both injury-related experiences and early childhood memories told by JFL learners and coded according to the earlier described coding categories) are as follows:

Example 1: Narrative components

- (1) Abstracts (summaries given at the beginning of the narrative)

kekko hidoi kega attan desu ga ...
 ‘(I) got injured pretty badly ...’
tuikanban herunia o sitan desu kedo ...
 ‘(I) had a slipped disk ...’
kazi datta.
 ‘(My house) was on fire.’
minna ni Hawaii ryokoo kureta toki no omoide.
 ‘The memory when (they) gave all of us a trip to Hawaii.’
- (2) Orientations (statements that provide the setting or context of a narrative)

kodomo no toki ni ...
 ‘When (I) was a child ...’
Baakuree ni ita toki desu keredomo ...
 ‘When (I) was in Berkeley ...’
hassai no toki ...
 ‘When I was eight years old ...’
- (3) Complicating actions (specific events that advance the plot of a narrative)

sono torakutaa no hoo e tikazuite itte ...
 ‘(I) went closer to that tractor ...’
de, okaasan ni denwa sitan desu yo.
 ‘Then, (I) called my mom, you know.’
ie ni haitte, sore zenbu akete ...
 ‘(I) went into the house, and opened all of them ...’¹
- (4) Evaluations (statements that tell the listener what to think about a person, place, thing, event, or [more globally] the entire experience described in a narrative)²

kedo, itakatta.
 ‘But, (it) **hurt**.’
taisita koto zya nakatta keredomo ...
 ‘(It) was nothing **serious** but ...’

¹ Note that this final example includes two actions, which are coded separately.

² As can be seen in the examples presented here, evaluations include high degrees of stress and emphasis (e.g., serious, very) and onomatopoeia (e.g., bang).

battaan to kao ni atatte!

‘(It) hit me in the face, **bang!**’

kizu ga sugoi hukai desita.

‘The wound **was very deep.**’

totemo tanosikatta desu.

‘(I) **enjoyed** (it) **a lot.**’

ii toki datta.

‘(Those) were **good** days.’

(5) Reported speech (references to past speech)

watasi no giri no titi ga desu ne, “aa, sore wa tyotto ne byooin ni iku hoo ga ii kamo ne” to itte.

‘My father-in-law said, “Oh, that (injury), maybe you had better go to a hospital.”’

“watasi-tati mo yasumi o toru yotei ga arimasu yo” to okaasan ga ittara ...

‘When my mom said, “We are also planning to take a vacation, you know” ...’

“syuzyutu sinai to hyaku paasento naosenai” to iimasita kara ...

‘Because (the doctor) said, “Unless you have an operation, the injury won’t be cured completely” ...’

isya ga “tyotto X-ray tonnakya ikenai” tte.

‘The doctor said, “You have to have an X-ray.”’

boku to o-nii-tyan wa nanka “hebi da yo” nante itte ...

‘Me and my older brother said things like “There’s a snake.” ...’

nanode, otoosan ga “hai, yorosii” to iimasita.

‘So, my father said, “Yes, (you) have my permission.’

(6) Codas (formalized endings of a narrative)

zya, sore dake desu.

‘Well, that’s it.’

ano, ma, sore kurai kana.

‘Well, (I) guess that’s all.’

hai, izyoo.

‘Yeah, that’s all.’

The following two stories were told by the same narrator, who was categorized as an advanced JFL learner. His injury-related story develops through temporal juncture (thus focusing on foreground information). His early childhood memory (only the beginning part is shown below, though, due to its fairly long length), in contrast, focuses on background information. In other words, his injury-related story tended to be action focused, whereas his early childhood memory is fairly static.

Example 2a: An injury-related story told by an advanced JFL learner

nihon ni mo kega ga arimasita.

‘(I) got injured in Japan as well.’

Tookyoo desita.

'That was in Tokyo.'

boku wa, ame ga hutteiru hi ni, miti o hasitte ikimasita.

'I was running along the street on a day when it was raining.'

resutoran made.

'Toward a restaurant.'

demo, kasa o motte imasen desita.

'But, I did not have an umbrella.'

betu no hito wa, kasa o motte.

'Other people were carrying umbrellas.'

motiron, boku wa me o mamoru tame ni, ude de me o mamotte imasita.

'Of course, I was protecting my eyes with my arm.'

demo, hasitte,

'But I was running,'

totuzen mise no kokuban, atama de butukatte,

'when all of a sudden, I bumped my head on a shop's blackboard, and'

koo hada o kirimasita.

'it cut the skin here.'

ti ga dete-kimasita.

'It started to bleed.'

resutoran ni haitte,

'(I) entered the restaurant,'

ueitoresu ga konakatta.

'but the waitress did not come.'

"doosite" to zibun wa kikimasita keredomo,

'Although "Why?" I asked myself,'

tabun boku ga gaikokuzin desu kara,

'Perhaps because I am a foreigner,'

dono mono ga tabetai ka, siranakakatta kara,

'because (I) did not know what (I) wanted to eat,'

dakara boku wa syoouindoo ni itte,

'so I went to the show-window,'

mokei o mite,

'(I) looked at the samples,'

sasitakatta.

'and (I) wanted to point (at the one that I wanted to eat).'

keredomo, boku no kao no han'ei o mite,

'However, (I) saw the reflection of myself (in the show-window glass),'

ti to mizu ga mazete ne,

'Blood and water mixed, you know,'

kao hidoku, hontoni minikui.

'My face was terrible, really ugly.'

dakara, otearai ni itte,
 ‘Therefore, (I) went to the restroom,’
kao o aratte,
 ‘(I) washed my face,’
dete,
 ‘and as (I) left (the restroom),’
ueitoresu ga minna hohoende masita.
 ‘the waitresses were all smiling.’
izyoo desu.
 ‘That’s it.’

Example 2b: A childhood memory told by the same advanced JFL learner

boku wa Kariforunia no Baakuree umare.
 ‘I was born in Berkeley, California.’
soko ni nizyuu-is-sai made sunde imasita.
 ‘(I) lived there until (I) was twenty-one years old.’
sono toki, boku wa daigaku no tikaku ni sunde imasen desita.
 ‘I did not live in the neighborhood of the university then.’
boku-tati no ie wa tiisai Itaria mati to yuu tokoro ni sunde imasita.
 ‘Our house was in a place called Little Italy, and (we) lived there.’
sohubo to issyo ni sunda kara,
 ‘Because (I) lived with my grandparents,’
kare-ra wa eigo ga dekinakatta kara,
 ‘because they did not speak English,’
sabetu ga arimasita.
 ‘(they) experienced discrimination.’
ato wa, gakkoo tanosikatta koto toka Kurisumasu no omoide toka, kazoku no omoide toka.
 ‘Other (early childhood) memories are my happy school days, Christmas memories, and memories of my family.’

3.4 Quantitative analysis

3.4.1 Narrative structure: Length and vocabulary

As described earlier, the CLAN program (MacWhinney 2000; MacWhinney and Snow 1985, 1990) was used to calculate narrative lengths (including the total number of words, the total number of different words, and the total number of clauses) and narrative components (i.e., appendage, orientation, complicating action, evaluation, and reported speech). First, correlational analyses were used for analyzing the relationships between the two topics – an injury-related experience and an early

childhood memory – in terms of the total number of words, the total number of different words, and the total number of clauses (note that a clause was considered to be a subject-predicate proposition). As can be seen in Table 1, those JFL learners who constructed long narratives, using a large quantity of words as well as a great variety of words for one story, tended to do so for the other story. Conversely, those JFL learners who constructed short narratives, using few words and a small variety of words for one story, tended to do so for the other story as well. The positive associations between the two topics, therefore, revealed that the choice of topic did not influence narrative length or vocabulary.

Table 1: Inter-Topic Correlations: Correlations between the Total Number of Words, the Total Number of Different Words, and the Total Number of Clauses across the Two Topics

	Injury-related stories		
	Total number of words	Total number of different words	Total number of clauses
Early childhood memories			
Total number of words	.74****	.77****	.82****
Total number of different words	.75****	.80****	.82****
Total number of clauses	.62***	.67****	.72****

*** $p < .001$. **** $p < .0001$.

3.4.1.1 Proficiency level differences

The above relationships illustrate the overall tendencies of both groups together. Further analysis was conducted to show differences between the two groups. Table 2 presents a summary of the means and standard deviations of the total number of words, the total number of different words, the total number of clauses, and the type-token ratio (which is a measure of lexical diversity computed by dividing the total number of different words used by the total number of words used in the narrative – Templin 1957) obtained from the injury-related stories and early childhood memories told by the two different levels of JFL learners. A series of independent-samples *t* tests was conducted, and statistically significant differences between the two groups were observed in the total number of words, the total number of different words, and the total number of clauses.³ Advanced JFL learners thus tended to construct longer narratives using more words in greater variety regardless of the narrative topic. However, there was no significant statistical difference between the two groups in terms of the type-token ratio.

³ As can be seen in Table 2, whenever the population variances are not assumed to be equal, the *t*-statistic based on unequal variances was used. When the variances of the two samples were quite different, therefore, this procedure reduced the degrees of freedom.

Table 2: Means and Standard Deviations of Total Number of Words, Total Number of Different Words, Type-Token Ratios, and Total Number of Clauses in Narrative Production

	Intermediate Learners (<i>n</i> = 17)		Advanced Learners (<i>n</i> = 15)		<i>t</i> value	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Total number of words						
Injury stories	145.06	85.62	396.40	390.24	2.44*	15.19
Early childhood memories	126.24	85.77	303.20	225.06	2.87**	17.57
Total number of different words						
Injury stories	68.65	30.39	164.87	118.18	3.24***	30
Early childhood memories	64.29	33.84	133.53	74.09	3.33***	19.06
Type-token ratio						
Injury stories	.54	.14	.47	.09	1.71†	27.63
Early childhood memories	.58	.14	.51	.11	1.47	30
Total number of clauses						
Injury stories	21.41	10.13	64.20	52.11	3.13**	14.94
Early childhood memories	23.35	17.63	46.27	31.34	2.50*	21.44

† $p < .10$. * $p < .03$. ** $p < .01$. *** $p < .005$.

Overall, the results obtained suggest that, irrespective of the narrative topic, vocabulary size was found to be one of the important factors distinguishing L2 narrative proficiency levels. Regardless of the topic, compared to the intermediate JFL group, the advanced JFL learners constructed longer narratives, using more words and a greater variety of words. However, a marginal difference was observed in the type-token ratios between advanced learners and intermediate learners. As can be seen in Figure 2, the intermediate group's type-token ratio was higher than that of the advanced group for injury stories, $t(28) = 1.71$, $p < .10$. Presumably, therefore, as their L2 skills advanced, JFL learners employed such strategies as repeating the same vocabulary and lengthening the narrative. Despite certain limitations in vocabulary, advanced learners appear to have acquired the skill of lengthening their narratives.

3.4.1.2 Proficiency level differences in the two different topics (the total number of clauses)

It is interesting that the ratio of the lengths of stories on the two topics was quite different for the two groups of JFL learners. Although the advanced JFL group produced 46.27 ($SD = 31.34$) clauses on average when narrating early childhood memories, they produced longer narratives on the injury-related topic, 64.20 ($SD = 52.11$) clauses on average (see Figure 3). Although marginal, a difference was observed between the two topics in the advanced learners' narratives, $t(14) = 1.81$, $p < .10$. On

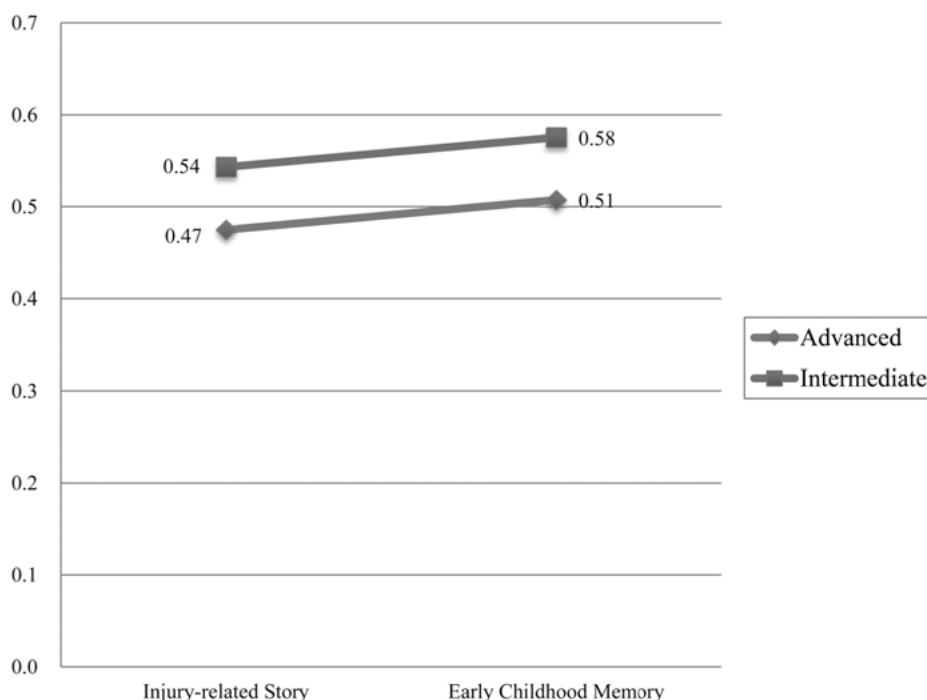


Figure 2: Proficiency level differences in the two different topics: Type-token ratios

the other hand, the intermediate learners produced narratives of almost identical length; they created 23.35 ($SD = 17.63$) clauses on average for early childhood memories and 21.41 ($SD = 10.13$) clauses on average for injury-related stories, $t(16) = .62$, *ns*.

The following explanation will serve to link the results above to the subsequent narrative analysis. As can be seen in the two contrasting narrative examples in the qualitative analysis section, reporting temporally related events (foreground information) is of prime importance in injury-related stories. In early childhood memories, on the other hand, because increased importance is placed on background information (e.g., orientation) rather than on foreground information, the stories tended to become shorter. This explanation holds for advanced JFL learners, but not for intermediate learners. For intermediate learners, narrative length did not seem to be related to the topic. Presumably, intermediate learners were not so capable of changing the narrative focus (placing emphasis on either foreground information or background information) depending on the topic. The next section will further examine this assumption.

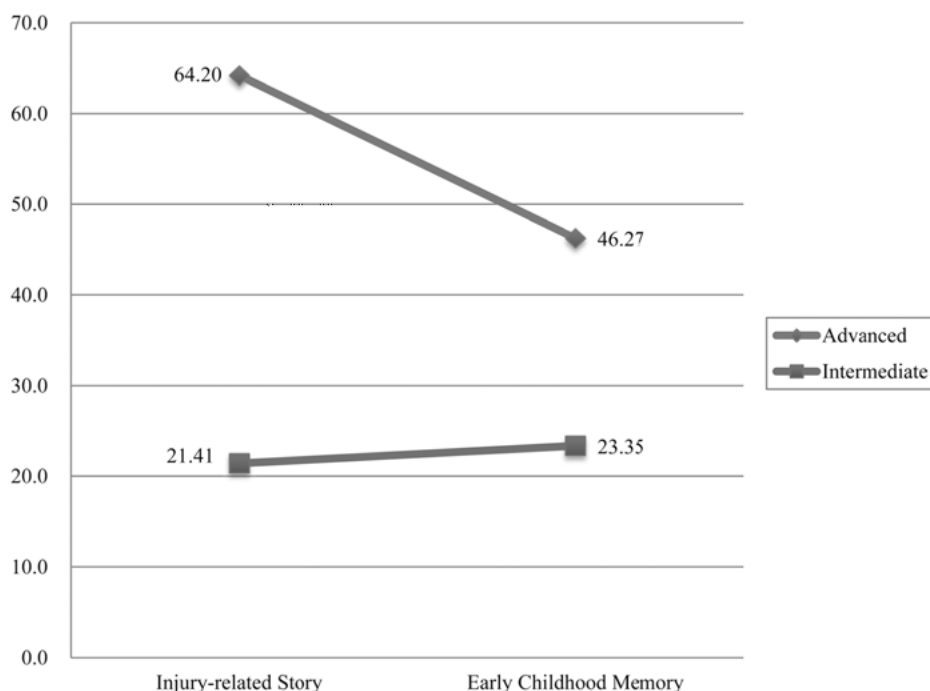


Figure 3: Proficiency level differences in the two different topics: Total number of clauses

3.4.2 Narrative structure: Story components

An analysis was conducted to identify structural differences between the two topics and between the two levels of JFL learners. First, correlational analyses were used for analyzing the relationships between the two topics in terms of narrative components. Note that, of the earlier-described six components, abstracts (summaries of the whole narrative that appear at its outset) and codas (endings of a narrative) were put together as appendages primarily because their frequencies were low and because, as Peterson and McCabe (1983) explain, they can be included in the composite category. As seen in Table 3, except for appendages, statistically significant relationships were identified in the corresponding components. For instance, those JFL learners who tended to provide complicating actions (i.e., foreground information) in one topic also tended to provide complicating actions in the other topic, $r(30) = .73$, $p < .0001$. In like manner, those who tended to include orientation statements and evaluative comments, which are both background information, in one topic also tended to narrate stories about the other topic using a greater number of orientation statements, $r(30) = .63$, $p < .0001$, and evaluative comments, $r(30) = .58$, $p < .0001$.

Table 3: Inter-topic Correlations: Correlations between the Two Topics in Narrative Components – Appendage, Orientation, Complicating Action, Evaluation, and Reported Speech

	Injury-related stories				
	Appendage	Orientation	Complicating action	Evaluation	Reported speech
Early childhood memories					
Appendage	-.04	.09	.34	.24	.38*
Orientation	.34†	.63****	.81****	.76****	.54**
Complicating action	.21	-.55***	.73****	.71****	.61***
Evaluation	.26	.48**	.61***	.58***	.48**
Reported speech	.02	-.04	.08	.09	.34†

† $p < .06$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

3.4.2.1 Injury-related stories

The above table shows the overall tendency of both groups of JFL learners. Further analysis was conducted in order to compare the results for each group by individual narrative component. As seen in Table 4, a series of independent-samples t tests was conducted for the five coding categories: (1) appendages, (2) orientation statements, (3) complicating actions, (4) evaluation statements, and (5) reported speech. With regard to raw frequencies, the advanced JFL learners provided more of each of these narrative components than did the intermediate learners (except for appendages).

Not only were raw frequencies counted, but the proportional frequency was also calculated by dividing each narrative category by the total number of incidences. Proportions were used because they correct for differences in the number of occurrences and allow us to see the relative emphasis on each component of narration. Interestingly, analyzing the data using proportional frequencies revealed, except for reported speech, no statistically significant differences between advanced and intermediate JFL learners in any narrative component.

3.4.2.2 Early childhood memories

The other topic (early childhood memories) was analyzed in the same manner. As seen in Table 5, a series of independent-samples t tests was conducted for the five dependent variables of early childhood memories, (1) appendages, (2) orientation statements, (3) complicating actions, (4) evaluation statements, and (5) reported speech. With regard to raw frequencies, it was found that the advanced JFL learners provided more orientation and evaluation statements (i.e., background information) and complicating actions (i.e., foreground information) than did the intermediate learners. Analyzing the data using proportional frequencies, however, revealed no statistically significant differences between advanced and intermediate JFL learners

Table 4: Injury-Related Stories: Mean Frequencies and Percentages (Standard Deviations) of Narrative Components

	Intermediate Learners (<i>n</i> = 17)		Advanced Learners (<i>n</i> = 15)		<i>t</i> value	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Appendages						
Frequencies	1.24	1.72	1.60	1.55	.63	30
Percentages	6.08%	7.63	2.99%	2.81	1.55	20.72
Orientations						
Frequencies	5.47	3.26	13.93	15.18	2.12†	15.14
Percentages	24.96%	10.47	21.36%	8.16	1.07	30
Complicating actions						
Frequencies	5.41	2.81	16.87	18.26	2.41*	14.59
Percentages	25.68%	10.11	24.84%	8.17	.26	30
Evaluations						
Frequencies	9.71	5.57	30.13	26.72	2.91**	15.07
Percentages	41.61%	14.82	45.28%	7.78	.89	24.79
Reported speech						
Frequencies	.59	1.37	3.47	3.23	3.21***	18.41
Percentages	1.67%	3.63	5.53%	4.73	2.61**	30

†*p* < .06. **p* < .03. ***p* < .02. ****p* < .005.

in any narrative component, except for orientation statements (which approached statistical significance). In terms of proportions, when it comes to narrating early childhood memories, therefore, no structural differences were identified between the two levels of JFL learners.

3.4.2.3 Proficiency level differences in the two different topics (raw frequencies)

A series of paired-samples *t* tests was conducted to see whether there were structural differences by narrative topic. As can be seen in Figure 4, intermediate JFL learners provided similar numbers of evaluative comments for both topics [*M* = 9.71 (*SD* = 5.57) for the injury-related story and *M* = 8.82 (*SD* = 7.25) for the early childhood memory], *t*(16) = .72, *ns*. On the other hand, advanced JFL learners provided greater numbers of evaluative comments when telling injury-related stories (*M* = 30.13, *SD* = 26.72) than when recounting early childhood memories (*M* = 16.67, *SD* = 11.02), *t*(14) = 2.24, *p* < .05. The result of an independent-samples *t* test indicated that the difference between the two topics in advanced learners was on average greater than that of intermediate learners, *t*(30) = 2.17, *p* < .04.

Table 5: Early Childhood Memories: Mean Frequencies and Percentages (Standard Deviations) of Narrative Components

	Intermediate Learners (<i>n</i> = 17)		Advanced Learners (<i>n</i> = 15)		<i>t</i> value	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Appendages						
Frequencies	1.35	1.94	1.80	2.76	.54	30
Percentages	7.68%	11.54	3.19%	3.26	1.46	30
Orientations						
Frequencies	6.88	3.94	19.73	14.06	3.42***	15.94
Percentages	33.49%	12.12	40.63%	8.95	1.87†	30
Complicating actions						
Frequencies	3.82	2.81	10.53	7.25	3.37***	17.69
Percentages	18.69%	10.96	21.33%	6.05	.86	25.49
Evaluations						
Frequencies	8.82	7.25	16.67	11.02	2.34**	23.70
Percentages	36.76%	13.39	33.15%	8.12	.91	30
Reported speech						
Frequencies	1.53	5.05	1.20	2.08	.24	30
Percentages	3.38%	7.05	1.71%	2.57	.91	20.65

†*p* < .08. ***p* < .03. ****p* < .005.

As for reported speech, as can be seen in Figure 5, advanced JFL learners used more reported speech when telling injury-related stories ($M = 3.47$, $SD = 3.23$) than when narrating their early childhood memories ($M = 1.20$, $SD = 2.08$), $t(14) = 2.69$, $p < .02$. An independent-samples *t* test was also conducted, and the result of the test indicated that the difference between the two topics in advanced learners was on average greater than that of intermediate learners, $t(30) = 2.48$, $p < .02$.

Intermediate JFL learners provided complicating actions more frequently when narrating injury-related stories ($M = 5.41$, $SD = 2.81$) than when telling their early childhood memories ($M = 3.82$, $SD = 2.81$), $t(16) = 2.62$, $p < .02$. Advanced learners, in contrast, provided a great number of complicating actions for each of the topics, presumably because complicating actions function as the “narrative skeleton”, $t(14) = 1.71$, *ns*. In fact, the result of an independent-samples *t* test between the two groups did not reach statistical significance, $t(30) = 1.35$, *ns*. Overall, therefore, whereas intermediate learners’ foreground information quantitatively changed, in the case of advanced learners the amount of foreground information did not change; instead, the amount of background information (i.e., evaluations) as well as the frequency of reported speech significantly changed.

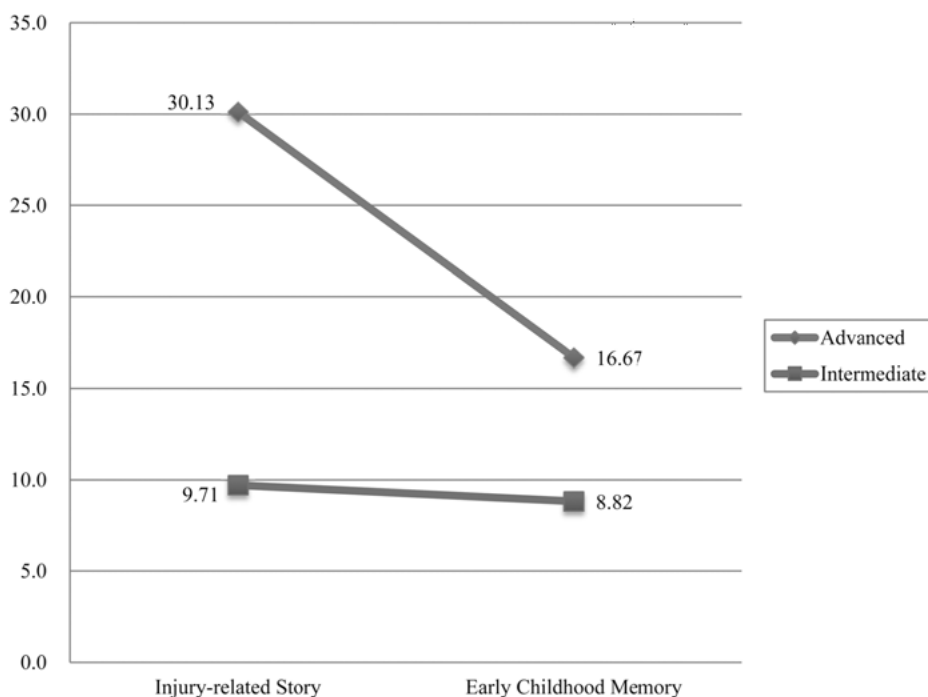


Figure 4: Proficiency level differences in the two different topics: Evaluations (raw frequencies, narrative component)

3.4.2.4 Proficiency level differences in the two different topics (proportional frequencies)

A series of paired-samples *t* tests was conducted to see whether there were proportional differences by narrative topic. As can be seen in Figure 6, in intermediate JFL learners' injury-related narratives, orientation statements occupied 24.96% (*SD* = 10.47) whereas in their early childhood memories, orientation statements occupied 33.49% (*SD* = 12.12) on average; thus, there was a difference of 8.5%, $t(16) = 3.05$, $p < .01$. Compared to intermediate JFL learners, advanced JFL learners provided many more orientation statements when telling early childhood memories (40.63% of the narrative on average, *SD* = 8.95) whereas they provided fewer orientation statements when telling injury-related stories (21.36% of the narrative on average, *SD* = 8.16), $t(14) = 6.08$, $p < .0001$. An independent-samples *t* test was also conducted, and the result of the test indicated that the difference between the two topics in advanced learners was on average greater than that of intermediate learners, $t(30) = 2.55$, $p < .02$.

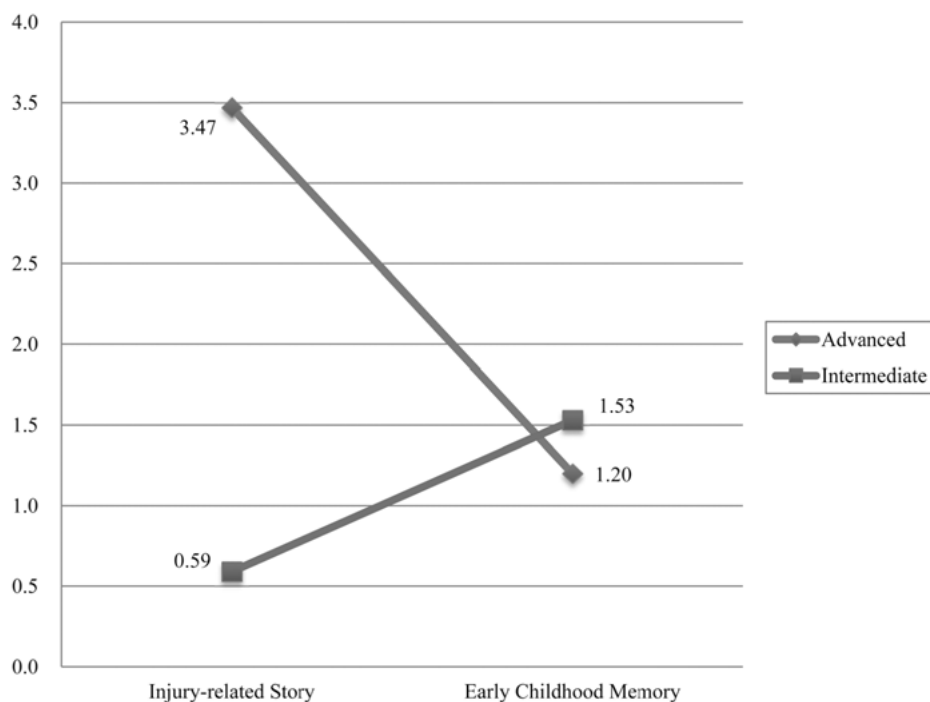


Figure 5: Proficiency level differences in the two different topics: Reported speech (raw frequencies, narrative component)

It is clear, then, that when controlling for narrative length, the difference in orientation statements appears irrespective of the proficiency level. It is found, however, that advanced JFL learners used far more orientations when telling their early childhood memories than when narrating injury-related stories. In their injury-related stories orientation statements comprised a little more than 20% of the entire narrative on average. In their early childhood memories, on the other hand, orientation statements increased dramatically and comprised more than 40% of the entire narrative on average. In contrast, in intermediate JFL learners' injury-related stories orientation statements comprised a little less than 25% on average. While orientation statements increased when telling early childhood memories, the increase was not so dramatic as that of advanced JFL learners; in intermediate JFL learners, orientation statements for early childhood memories comprised a little less than 34% of the entire narrative on average.

Advanced JFL learners also provided evaluative comments proportionately more frequently when narrating injury stories (45.28% of the narrative on average, $SD = 7.78$) than when narrating early childhood memories (33.15% of the narrative on

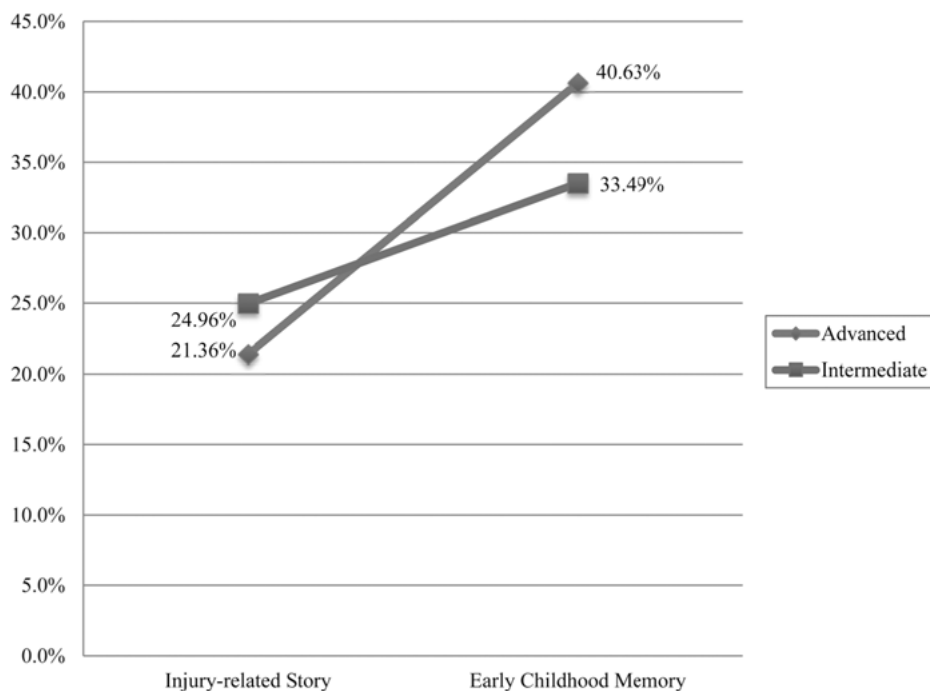


Figure 6: Proficiency level differences in the two different topics: Orientation (proportional frequencies, narrative component)

average, $SD = 8.12$, $t(14) = 3.95$, $p < .001$. On the other hand, intermediate JFL learners provided complicating actions proportionately more frequently when narrating injury stories (25.68% of the narrative on average, $SD = 10.11$) than when narrating early childhood memories (18.69% of the narrative on average, $SD = 10.96$), $t(16) = 2.45$, $p < .03$. Recall that advanced learners consistently provided a great number of complicating actions regardless of the narrative topic. The results obtained thus suggest that advanced learners, consistently providing a great amount of plot-advancing foreground information (i.e., complicating actions), also provided more contextualizing background information to the story (i.e., orientations and evaluations) when they judged it necessary to narrate a particular type of topic.

Finally, as for reported speech, as can be seen in Figure 7, intermediate JFL learners used reported speech more frequently when telling their early childhood memories (3.38% of the narrative on average, $SD = 7.05$) than when narrating injury-related stories (1.67% of the narrative on average, $SD = 3.63$). However, the difference did not reach statistical significance, $t(16) = 1.49$, *ns*. This tendency was reversed in

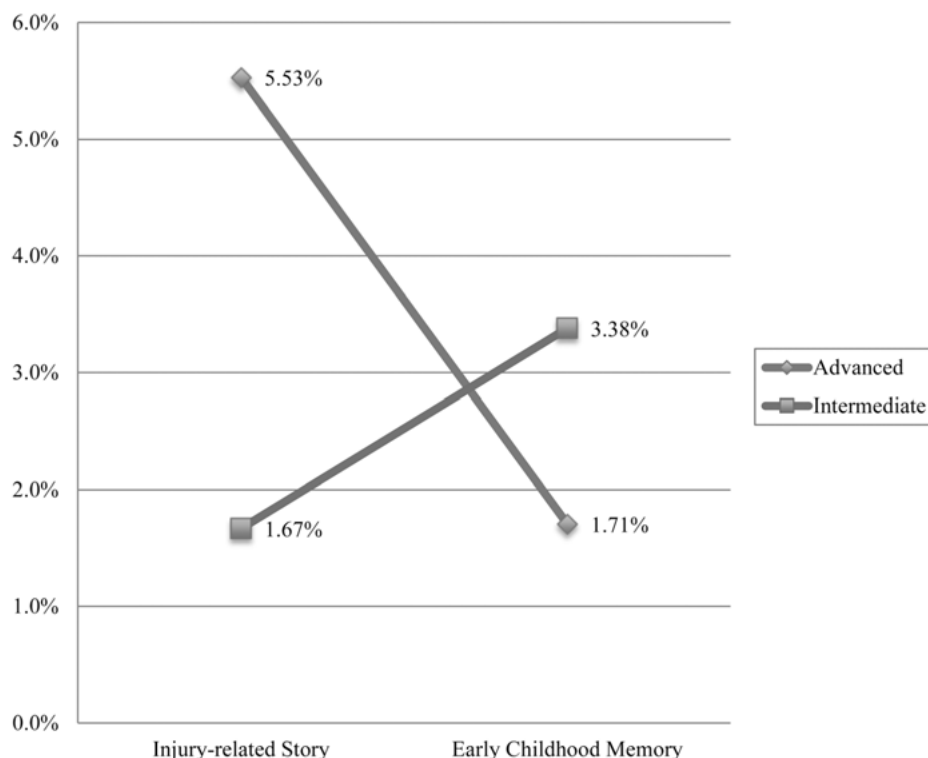


Figure 7: Proficiency level differences in the two different topics: Reported speech (proportional frequencies, narrative component)

the case of advanced learners, who used more reported speech when telling injury-related stories (5.53% of the narrative on average, $SD = 4.73$) than when narrating their early childhood memories (1.71% of the narrative on average, $SD = 2.57$), $t(14) = 2.82$, $p < .02$. In fact, an independent-samples t test between the two groups testing the difference between reported speech usage by intermediate and advanced JFL learners on the two topics was significant, $t(30) = 3.13$, $p < .004$.

4 From present research to future research

4.1 Summary and discussion

There has been an increasing interest in the study of narratives exemplifying typical human discourse. But there are many ways to tell a story, and storytelling is a frequent and effective way of communicating not only between native speakers but also between language learners. This chapter has addressed some of the many

factors that play roles in L2 learners' developing narrative skills, with special attention on narrative length, narrative structural features, and narrative topics. First, two measures of length were derived: (1) word count (i.e., the total number of words in the narrative) and (2) clause count (a clause was considered to be a subject-predicate proposition). The results of cross-level (i.e., intermediate and advanced) comparisons have demonstrated that although all of the language learners involved in this study had sufficient command of the language to tell personal narratives using the target language, vocabulary size was one of the most important predictors distinguishing their L2 proficiency levels. Second, a comparison of intermediate and advanced learners predictably revealed that more advanced JFL learners tended to construct longer narratives using more words in greater variety and thus provided more information in their narratives.

Using the Labovian analytical framework (Labov 1972, 2013), this chapter further explored the structure of L2 learners' narratives. Recall that Labovian analysis introduced the definition of narrative as a technique of reporting past events through temporal juncture and established a basis for the understanding of the temporal organization and evaluation of narrative. Also recall that foreground information (namely, complicating actions) refers to the parts of the narrative that relate a sequence of events with respect to a timeline and thus belongs to the skeletal structure of the narrative. In contrast, background information refers to supportive narrative, including orientations, which present static descriptions of the scene, and evaluations, which describe the agent's motives. Both qualitative and quantitative analyses were conducted, and we observed general tendencies such as frequent use of foreground information for injury-related stories and background information for early childhood memories. The observations were supported by statistical analysis. In what follows, the results obtained in this study are summarized and discussed.

The narrative components (i.e., complicating actions, orientation statements, evaluation statements, appendages, and reported speech) used by the two different levels of JFL learners on the two different narrative topics were compared by counting both raw and proportional frequencies. Comparisons of raw frequencies revealed that, regardless of narrative topic, advanced JFL learners provided more foreground information (i.e., complicating actions) and background information (i.e., both orientation and evaluation statements) [and, additionally, reported speech for injury-related stories] than did intermediate learners. Interestingly, however, when it comes to proportional frequencies, except for reported speech for injury-related stories and orientation statements for early childhood memories, there were no significant differences observed in any narrative component between advanced JFL learners and intermediate JFL learners. In other words, although the narratives produced by intermediate JFL learners contained less reported speech for injury-related stories and orientation statements for early childhood memories than those produced by advanced JFL learners, and, in addition, were shorter and used a smaller vocabulary,

the narrative components (and thus the overall narrative structure) did not differ greatly from those used by advanced JFL learners.

Here, there are two issues related to cognition that we need to discuss separately. First, what appears to be different between advanced and intermediate learners lies in cognitive flexibility or the flexible use of L2 skills depending on the topic. As their language skills advance, JFL learners tend to produce longer narratives using more words in greater variety, and are inclined to use more reported speech for action-oriented injury-related stories in order to describe complicating actions (i.e., foreground information) more vividly and tend to provide more orientation statements (i.e., background information) for static early childhood memories. Compared to advanced JFL learners, intermediate JFL learners do not seem to be able to employ the same flexibility in varying their narratives depending on the topic.

Second, with regard to the fact that the overall narrative structure did not differ greatly between advanced and intermediate JFL learners, we may take this either as a reflection of a universal pattern (i.e., basic narrative patterns are identical regardless of languages and cultures) or as a transfer of JFL learners' L1 narrative discourse patterns to the L2 context. To begin with, a structural description of narrative from one language group (English in this case) is too limited for any assumption of universality. Instead, we may need to investigate culturally preferred narrative styles and their effects on L2 narrative styles. Kang (2006), for instance, brings to light the strong influence of L1 (Korean in this case) discourse strategies on English narratives produced by English-as-a-Foreign-Language learners; she claims that Korean cultural strategies are evident in Korean English learners' English narrative discourse rather than the preferred narrative discourse style of the target language and culture. In either case, issues of universality and cultural specificity in language development either in L1 or L2 continue to be controversial.

4.2 What we know and what we don't know: For future research

Investigating adult JFL learners' oral personal narratives in order to examine how their narratives develop, the study described in this chapter specifically examined narratives told in Japanese by adult JFL learners with a particular focus on narrative length and structural characteristics in two different topics. As summarized above, the study described in this chapter has, in a sense, revealed mixed results in terms of the relationship between the level of narrative skill and the amount of non-sequential information. Initial comparisons by using raw frequencies indicated that, in L2 acquisition, there is a positive relationship between an individual's narrative skill and the amount of background information (i.e., orientation and evaluation) he or she adds to the narrative. Comparisons of proportional frequencies, however, have revealed somewhat different patterns. What initially appeared to be a difference between intermediate and advanced L2 learners did not appear so when narrative

length was controlled using proportional frequencies. In other words, the relationship between “the better an individual’s narrative skill becomes” and “the more non-sequential information he or she adds to the narrative” holds simply because advanced learners produce longer narratives.

Certain issues need to be addressed in future studies. Issues of universality and cultural specificity described above are some of them. Advanced JFL learners’ production of fairly long narratives observed in the current study is also considered a critical issue. Recall that when telling injury stories in particular, advanced JFL learners lengthened their narratives with repeated use of the same vocabulary, as indicated by the type-token ratio (obtained by dividing the total number of different words by the total number of words). This means that as L2 skills advance, using the same vocabulary repeatedly seems to be a viable strategy to make L2 narrative effective. However, we do not know whether or not this strategy is what native Japanese speakers also employ when telling personal narratives. Or, more generally, we do not know whether adult JFL learners’ oral personal narratives begin to produce native-speaker-like narratives as their language proficiency levels increase.

In this sense, a comparison of the narratives told by JFL learners with those produced by native Japanese speakers might reveal that even JFL learners with more highly developed L2 language skills do not necessarily follow the native-style narrative patterns. For instance, advanced JFL learners may be inclined to talk somewhat excessively when judged by native Japanese speakers’ norms. If this is the case, then we may suggest that advanced JFL learners’ production of fairly long narratives implies either the existence of U-shaped patterns of behavioral growth (i.e., the overuse of available devices at a certain point in language development – Kellerman 1985) or the strong influence of L1 discourse strategies on L2 narratives (as discussed above), or a combination of both.

If the existence of U-shaped patterns of behavioral growth holds true, our interpretation would be that L2 learners’ overuse of certain narrative strategies occurs in the developmental process because they might believe that a long narrative satisfies one of the requirements for a good narrative. Yet the possibility of the putative transfer of L1 narrative patterns should also be taken into consideration. If this is the case, loquaciousness could be the norm in L2 learners’ first language as well as a reflection of socially accepted behavior in their native culture.

The fact that language can be thought of as both a manifestation and a product of culture presents complex issues in an L2. As Stavans (2003: 153) puts it, “The adult bilingual is a narrator with one set of experiences that are subject to expression in either of two linguistic systems, each of which may be constrained by a different storytelling culture.” According to Berman (2004: 9), language proficiency involves a complex configuration of interrelated types of knowledge: (1) linguistic command of the full range of expressive options, both grammatical and lexical, available in the target language, (2) the cognitive ability to integrate forms from

different systems of grammar, and to develop those options to meet different communicative goals and discourse functions, and (3) cultural recognition of the favored options of a given speech community, adapted to varied communicative contexts and to different norms of usage. The current chapter has, at least in part, answered lexical issues, which correspond to the first one in Berman's categorization, and cognitive issues (as seen in advanced JFL learners' increasing awareness of the importance of contextualizing background information and changing emphasis on narrative components depending on the topic), which correspond to the second in Berman's categorization. Yet this study may not have fully addressed the third one, for instance, whether the advanced JFL learners, not overly loquacious, provide desirable lengths of narratives. As Vygotsky (1978) suggested, social experience (narrators' experiences in their L1 society, in this case) possibly shapes certain kinds of interpretive processes (e.g., narrators' conceptualization of what the desirable amount of narrative should be). Overall, in the examination of JFL learners' L2 narrative discourse patterns, future research employing cross-cultural comparison of narratives (i.e., including native speakers) is highly desirable, and such research may reveal that L2 learners develop different strategies from those used by native speakers (e.g., loquaciousness), and that some of L2 learners' strategies may reflect the influence of L1 on their L2 narratives.

5 Conclusion

To conclude, narratives use language to fuse together culture, cognition, and personal attitude. Whether we use our L1 or an L2, we tell stories to perform such important functions as mediating interpersonal relationships, introducing ourselves, and making sense of experience. Learning to imitate culturally specific narrative styles seems an appropriate goal in the acquisition of L2 skills. From the analysis of such styles we may uncover the techniques needed for L2 learners to acquire the means by which to encode their own perspectives and emotions in the target language in appropriate ways. To date, however, with some exceptions, few studies have been available that have extensively examined narratives in the context of L2 acquisition. Our knowledge about the culture-specific elements of narratives is limited, with the result that in many classrooms little attention is given to the style and structure of narrative discourse. Even though L2 learners' difficulties in conveying their messages in the target language may relate closely to their use of non-native narrative styles in their oral discourse, foreign language teaching is often limited to grammar and vocabulary. Although the traditional elements of language teaching are indisputably important, it is also important that language learners acquire the capacity to express themselves in the style of the language they are learning. In order to elevate the significance of narrative expression, it will first be important to more thoroughly

understand narrative styles through empirical discourse analysis. The research in this chapter has tried to answer such a demand.

Interestingly, in recent times, narrative tasks are increasingly employed in L2 classrooms (e.g., Banno et al. 2011; Inahara et al. 2009), but the tasks may not work effectively. The effectiveness of the specific tasks is dependent on several factors. Language instructors who plan to use narration activities will benefit from understanding not only what using these activities implies in the light of L2 learning and processing but also which narrative topics best fit different levels of language competence. The realization, confirmed in this study, that advanced L2 learners are more flexible in relating events in narrative implies the importance of topic selection in assigning narrative tasks to L2 learners. It is hoped that the research presented in this chapter provides an introduction to the place and nature of producing narratives within L2 learning and development.

References

- Bakeman, Roger and John M. Gottman. 1997. *Observing interaction: An introduction to sequential analysis*, 2nd edn. New York: Cambridge University Press.
- Banno, Eri, Yoko Ikeda, Yutaka Ohno, Kyoko Shinagawa and Kyoko Tokashiki. 2011. *Genki II: An integrated course in elementary Japanese*, 2nd edn. Tokyo: The Japan Times.
- Berman, Ruth A. 2004. Between emergence and mastery: The long developmental route of language acquisition. In Ruth A. Berman (ed.), *Language development across childhood and adolescence* (Trends in Language Acquisition Research 3), 9–34. Amsterdam and Philadelphia: John Benjamins.
- Bruner, Jerome. 1986. *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.
- Ely, Richard and Allyssa McCabe. 1993. Remembered voices. *Journal of Child Language* 20(3). 671–696.
- Feldman, Carol Fleisher, Jerome Bruner, Bobbi Renderer and Sally Spitzer. 1990. Narrative comprehension. In Bruce K. Britton and Anthony D. Pellegrini (eds.), *Narrative thought and narrative language*, 1–78. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Gwyn, Richard. 2000. “Really unreal”: Narrative evaluation and the objectification of experience. *Narrative Inquiry* 10(2). 313–340.
- Hopper, Paul J. 1979. Some observations on the typology of focus and aspect in narrative language. *Studies in Language* 3(1). 37–64.
- Hopper, Paul J. and Sandra A. Thompson. 1980. Transitivity in grammar and discourse. *Language* 56(2). 251–299.
- Inahara, Kyoko, Yukari McCagg, Yasu-Hiko Tohsaku and Noriko Fujimoto Vergel. 2009. *Doraemon no dokodemo Nihongo*. Tokyo: Shogakukan.
- Kang, Jennifer Yusun. 2003. On the ability to tell good stories in another language: Analysis of Korean EFL learners’ oral “frog story” narratives. *Narrative Inquiry* 13(1). 127–149.
- Kang, Jennifer Yusun. 2006. A discourse analysis of Korean EFL learners’ written narratives. *Narrative Inquiry* 16(2). 379–407.
- Kellerman, Eric. 1985. If at first you do succeed. In Susan Gass and Carolyn Madden (eds.), *Input in second language acquisition*, 345–353. Rowley, MA: Newbury House.
- Labov, William. 1972. *Language in the inner city: Studies in the Black English vernacular*. Philadelphia, PA: University of Pennsylvania Press.

- Labov, William. 1997. Some further steps in narrative analysis. *Journal of Narrative and Life History* 7(1–4). 395–415.
- Labov, William. 2006. Narrative pre-construction. *Narrative Inquiry* 16(1). 37–45.
- Labov, William. 2013. *The language of life and death: The transformation of experience in oral narrative*. New York: Cambridge University Press.
- Labov, William and Joshua Waletzky. 1967. Narrative analysis: Oral versions of personal experience. In June Helm (ed.), *Essays on the verbal and visual arts: Proceedings of the 1966 annual spring meeting of the American Ethnological Society*, 12–44. Seattle, WA: University of Washington Press.
- Landis, J. Richard and Gary G. Koch. 1977. The measurement of observer agreement for categorical data. *Biometrics* 33(1). 159–174.
- MacWhinney, Brian. 2000. *The CHILDES project, volume I: Tools for analyzing talk*, 3rd edn. Mahwah, NJ: Lawrence Erlbaum Associates.
- MacWhinney, Brian and Catherine E. Snow. 1985. The Child Language Data Exchange System. *Child Language* 12(2). 271–296.
- MacWhinney, Brian and Catherine E. Snow. 1990. The Child Language Data Exchange System: An update. *Child Language* 17(2). 457–472.
- Minami, Masahiko. 2002. *Culture-specific language styles: The development of oral narrative and literacy*. Clevedon, England: Multilingual Matters.
- Ochs, Elinor and Lisa Capps. 1997. Narrative authenticity. *Journal of Narrative and Life History* 7(1–4). 83–89.
- Ohta, Amy Snyder. 2001. *Second language acquisition processes in the classroom: Learning Japanese*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Peterson, Carole and Allyssa McCabe. 1983. *Developmental psycholinguistics: Three ways of looking at a child's narrative*. New York: Plenum.
- Reinhart, Tanya. 1984. Principles of gestalt perception in the temporal organization of narrative texts. *Linguistics* 22(6). 779–809.
- Stavans, Anat. 2003. Bilinguals as narrators: A comparison of bilingual and monolingual Hebrew and English narratives. *Narrative Inquiry* 13(1). 151–191.
- Tannen, Deborah. 2007. *Talking voices: Repetition, dialogue, and imagery in conversational discourse*, 2nd edn. New York: Cambridge University Press.
- Templin, Mildred C. 1957. *Certain language skills in children*. Minneapolis: University of Minnesota Press.
- Vygotsky, Lev S. 1978. *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wortham, Stanton. 2000. Interactional positioning and narrative self-construction. *Narrative Inquiry* 10(1). 157–184.

IV Corpus linguistics

Susanne Miyata and Brian MacWhinney

10 CHILDES for Japanese: Corpora, programs, perspectives

1 What is CHILDES

Apart from the invention of audio recording technology, few developments have had a greater impact on language research than the introduction of affordable micro-computers and the advent of the Internet in the seventies. These developments opened up increasingly powerful methods for storage, analysis, and sharing of large amounts of speech data. One of the most influential linguistic projects in this area has been the Child Language Data Exchange System (CHILDES: MacWhinney 2000). Founded in 1984, CHILDES is now a huge database of over 60 million words containing speech data of thousands of children and their caretakers from 34 languages, including Japanese. In 2001, the CHILDES framework was extended to include adult spoken language data as a part of the larger TalkBank Project. TalkBank (<http://talkbank.org>) and CHILDES (<http://childes.talkbank.org>) now include L2 acquisition data, conversation analysis data, data on phonological development, and a wide variety of clinical data.

One of the reasons for the international success of CHILDES has been its emphasis on the precise control of the format of the transcriptions, not only across corpora but also across languages. The CHAT transcription format (an acronym for Codes for the Human Analysis of Transcripts) consists of a small set of obligatory basic rules and a large variety of optional rules and codes for detailed coding of spoken patterns in terms of phonetics, morphosyntax, and Conversation Analysis. All CHILDES and TalkBank corpora conform tightly to this common CHAT standard, which can be validated through precise XML definitions.

Because the corpora adhere to this strict format, it is possible to construct accurate computational analyses of many facets of speech. The Computerized Language Analysis program (CLAN: MacWhinney, 2000) provides a range of analysis and utility commands fit especially to language analysis. Search commands like **FREQ** (computing the frequency of all or selected items), **KWAL** (producing lists of utterances containing a specified word or morpheme), **COMBO** (searching combinations of two specified words or morphemes), and **COOCCUR** (looking for patterns of co-occurrence between words) cover the basic needs. These commands can be run on multiple files, and adjusted with option switches specifying the speaker, the sample size, the data to be analyzed, the output format, and so forth. These option switches have been developed over the years in response to specific requests from child language researchers, and they cover basically all aspects of linguistic corpus analysis.

CLAN also includes a number of more specialized programs, such as CHAINS (tracking sequences of interactional codes), CHIP (examining repetitions and expansions between two speakers), DIST (examining patterns of separation between speech act codes), FREQPOS (tracking frequencies in various utterance positions), PHONFREQ (computing the frequency of phonemes in various positions), or MODREP (matching the child's phonology to the parental model). Major developmental assessment scores like the Mean Length of Utterance (Brown 1973) or the Developmental Sentence Scoring (Lee 1974) can be obtained in a single automatic step with the MLU and DSS commands.

For research questions that go beyond word-based configurations, such as speech acts, code switching, or speech errors, the use of coding tags has proved useful. In CLAN's "Coder Mode", tags can be attached to utterances by selecting from a set of options. The tags themselves are derived from a library file called *codes.cut*. This file contains a coding scheme that can be freely modified according to the researcher's aims. Once the transcriptions are coded, the coding tags can be searched and analyzed like ordinary words. Other types of codes can be inserted automatically. Examples of this type are the morphological and syntactic tags inserted by the MOR and GRASP commands. Both commands are based on language-specific library files. As grammatical tags provide a good basis for any kind of grammar-oriented research, most CHILDES corpora are now tagged for morphological information.

Other coding systems focus on speech errors, speech acts, and conversational features. Errors can be simply marked by [*], but it is possible to mark errors as involving phonology [* p], semantic [* s], neologism [* n], dysfluency [* d], or morphology [* m]; sentence level errors can be marked by postcodes (e.g., [+ gram]). Each error type can be further coded using extensions such as [* n:uk] for a neologism with an unknown word target, or they can be characterized further on the %err tier.

Speech act coding based on the Inventory of Communicative Acts – Abridged (INCA-A) proposed by Ninio et al. (1994) can be performed semi-automatically with a utility called Coder's Editor. On a separate %spa tier, codes for the type of interchange are combined with illocutionary force codes, as in the following example (1) in which "dhs" stands for "discussing hearer's sentiment", "yq" indicates a yes/no question.

- (1) *MOT: are ☺ you oka:y ☺ ↗ ?
 %spa: \$dhs:yq

This example also illustrates the use of special symbols for features of Conversation Analysis (CA) coding. Specifically, the funny faces indicate the beginning and end of "smile voice", and the up pointing arrow indicates final rising contour. Through these and other features, CHAT supports all of the codes of traditional Jeffersonian CA analysis. In addition, the use of special marks for the beginning and end of overlaps allows the INDENT program to automatically realign overlaps. Using

these and other methods, the CHAT format allows the combination of CA coding with conventional orthographic and speech act coding, thus making possible a wide range of analytic possibilities.

CLAN also provides extensive support for the linkage of individual words or utterances to audio or video media. A double click on an utterance launches the media source, and the corresponding video or audio is played back. The process of linking the video or audio to the utterances is facilitated by utility commands and specific linkage modes (“Sonic Mode” and “Transcriber Mode”). This support for fine-grained temporal linkage has greatly enhanced the quality and reliability of data transcription. At any moment in the process of transcribing and analyzing data, it is possible with a double click to go back precisely to the original utterance, and to correct the transcription, if necessary.

In addition to the analysis commands, a number of utility commands facilitate transcription, tagging, coding, and checking of the data, and translate external formats like ELAN, EXMARaLDA, Phon, Praat, and Transcriber to and from CHAT format.

The utility commands and transcription modes provide aids that greatly facilitate the transcription process. Nevertheless, the basic task of transcribing utterances has not been automated at present, and still constitutes a considerable workload, impeding any rapid expansion of the Japanese section of the database. In the following, we will look at the development of CHILDES in Japan, including the specific difficulties deriving from the fact that Japanese uses a non-Latin script, and try to analyze the problems and chances of the current situation.

2 The start of CHILDES in Japan: Romanization format and morphological tagging

Compared to English, Japanese research based on speech data corpora had a late start. The main reason for this can be found in the ideographic script, and the problems it posed for word processing. While Latin script typewriters became common already in the early 20th century, comparable machines were not commonly available for the complex Japanese script. As a result, research activities relied on handwriting long into the late 1980s. For example, the National Institute for Japanese Language and Linguistics published the longitudinal speech data of the boy Taro (1;0–3;11) in 1983 in the form of a facsimile of handwritten notes (Kokuritsu Kokugo Kenkyūjo 1981–1983). When the first electronic word processors appeared in the 1980s, it became possible to type and print a high number of ideograms, but the storage capacity was low, and the format was not compatible between the machines of different manufacturers. However, with the advent of the Japanese input method editor ATOK (JustSystems) in combination with the first Japanese word processing

software (“Ichitaro”) in 1985, microcomputers gradually started to become popular, and a more effective way of collecting, processing, and sharing of Japanese speech corpora became possible.

2.1 Romanization of the Japanese script, and the definition of morpheme and word boundaries

In the early 1990s, when the first rumors about CHILDES spread among Japanese linguists, several researchers started to enter their child speech data in the CHAT transcription format. But they soon faced a number of difficulties related to the Japanese script. At that time, the CHILDES data files were limited to ASCII code, a basic set containing the 26 alphabetic letters, a handful of punctuation marks, the numbers 0 to 9 and some control characters. This meant that the transcription of Japanese data had to be performed in the Latin alphabet. There are two traditional ways of Romanization for Japanese (the Kunrei-style and the Hepburn-style), but it turned out that neither one was stringent enough for database purposes.

The Kunrei-style Romanization is grounded on the *kana* syllabary matrix developed in the 11th century, which is arranged according to the first consonant in the order of *a i u e o*. The first line includes the syllables consisting only of a vowel (*a i u e o*), the second line includes the syllables starting with *k* (*ka ki ku ke ko*), and the following lines proceed with *s, t, n, h, m, y, r,* and *w* as first consonant. New pronunciations that became necessary for the pronunciation of Chinese loanwords imported in the following centuries were expressed with combinations of small *kana* (e.g., /tʃa/ is written with the syllable ち *ti* with a small や *ya* following: ちや). In the thousand years since this system was established, the pronunciation of some syllables has changed (Coulmas 1989). Here the difference between the two Romanization methods originates. The Kunrei-style presents the historical perspective, and transcribes the syllables according to their position in the syllabary (e.g., *sa si su se so; ta ti tu te to*). The Hepburn-style, on the other hand, reflects the modern pronunciation (e.g., *sa shi su se so; ta chi tsu te to*). Similarly, the combinations with small *kana* are transcribed as *tya* in the Kunrei-style, but as *cha* in Hepburn-style. Traditionally, the Kunrei-style is used in linguistics and grammar theory, and the Hepburn-style in second language teaching and research. In daily life, the Hepburn-style is preferred for transcriptions for the use by foreigners, such as road signs, but, in practice, the two systems are not strictly separated, and often a mix of both is used. For database purposes this meant that a number of decisions concerning the Latin orthography of Japanese had to be made.

A second problem was that Japanese *kana kanji* script does not mark word boundaries, and, as a result, there is no commonly shared consensus about what constitutes a “word”. The definition of words affects the results of most linguistic analyses since words are one of the basic analysis units of the CHAT format. Soon

discussions among researchers started, and when Yuriko Oshima-Takane called for participation in 1993, the JCHAT Project came into being. In 1995, the first JCHAT Workshop was held, and the first Japanese CHILDES manual was published (Oshima-Takane and MacWhinney 1995). This manual included an introduction to the CHAT format and the CLAN program, but the main focus was on the Romanization and the definitions of word classes and morphemes. Oshima-Takane and her colleagues formulated conclusive rules for both Romanization systems, the Kunrei-style and the Hepburn-style. However, in the following years it became clear that it was difficult to maintain support for two systems. Because the language corpora being collected were all formatted in the Hepburn-style, program development concentrated on the Hepburn-style, and currently analysis programs in the Kunrei-style are not supported.

The second focus of the JCHAT manual was on the definition of word boundaries and morphemes. Case and final particles were transcribed as separated words, while inflections and pre- and suffixes were attached to the stem. An utterance like Example 2a looks in Japanese CHAT format like Example 2b. The speaker is indicated by a 3-letter code preceded by *, and the utterance follows in Latin script.

- (2a) *Kirin-san ga o-hiru-gohan tabe-ta ne.*
 giraffe-HON NOM HON-noon-meal eat-PST TAG
 ‘Mr. Giraffe has eaten lunch, right?’

- (2b) *MOT: kirinsan ga ohirugohan tabeta ne. [CHAT format]

2.2 The development of the grammar analysis tools for Japanese

2.2.1 JMOR and MLU

The following years were devoted to the elaboration of word and morpheme definitions and the development of grammar analysis tools. The second edition of the JCHAT Manual (Oshima-Takane et al. 1998) already included a chapter on JMOR, the Japanese version of the morphological tagging command MOR. JMOR (Naka and Miyata 1999) produces a separate %mor tier for morphological tagging with information on word class, stem, and inflections for each word. Simultaneously, the first author of this chapter developed the closely connected Wakachi98 (Miyata and Naka 1998; Miyata 2003), a guideline for the segmentation of words and the definition of word classes and affixes based on Masuoka and Takubo (1995). The need to define every single word encountered in the mother-child conversations of the database forced us to make decisions also for grey zone cases that are usually not accounted for in grammar analysis, and led to a comprehensive MOR lexicon with currently ca. 12,000 entries including more than 300 prefixes and suffixes (Miyata

and Naka 2010). The current version JMOR05 includes English translation. Both JMOR and Wakachi2002 can be downloaded separately from the CHILDES homepage at <<http://childes.talkbank.org/morgrams/>>. Example 3 gives the MOR output for the sample sentence used above (Example 2).

- (3) *MOT: kirinsan ga ohirugohan tabeta ne.
 %mor: n|kirin-san=giraffe_HON ptl:case|ga=NOM
 o#n|+n|hiru+n|gohan= HON_lunch
 v:v|tabe-PAST=eat ptl:fin|ne=TAG.

The MOR command works semi-automatically in combination with the POST command. MOR produces all possible analyses of each word. For example, the nominative case particle *ga* is analyzed as conjunctive particle (ptl:conj|ga=although), case particle (ptl:case|ga=NOM), and noun (n|ga=moth). The POST command chooses the best-matching solution according to the context. In example above, the conjunctive particle and the noun are both ruled out, because *ga* follows a noun. POST uses statistical information obtained by training based on a sample corpus. The accuracy rate is rather high (for the Tai corpus we obtained an average of 0.8 mistakes in 100 utterances), although the error rate might be higher for other corpora. The disambiguation of homophones of the same word class needs a check of the context (鼻 n|hana=nose versus 花 n|hana=flower; 掛ける v:v|kake-PRES=hook versus 書ける v:c|kak-POT-PRES=write), and cannot be performed automatically, but has to be done by hand. The “disambiguation mode” facilitates this procedure.

Once the morphological tags are attached and checked for reliability, they can be used in multiple ways. Because the %mor line contains grammatical information on word class, stem, and eventual suffixes, precise database searches on word classes or specific grammatical inflections become possible. For example, the frequency of certain word types or inflections (FREQ), lists of utterances containing these word types or inflections (KWAL), as well as combinations (COMBO) and patterns of co-occurrence (COOCCUR) can be easily computed. Also cross-linguistic semantic analysis is possible with the help of translation tags: semantic groups like color terms or mental verbs can be searched simultaneously in a range of languages with a simple search file containing a list translation terms for colors (*=red, *=blue, etc.) or mental verbs, respectively (*=think, *=believe, etc.).

Moreover, the %mor line serves as the starting point for the automatic computation of developmental assessment, such as the Mean Length of Utterance (MLU: Brown 1973), a widespread measure for the grammatical development up to age four. Although the idea of measuring the average sentence length had appeared as early as 1943 in the Japanese language acquisition research literature (Ushijima and Moriwaki 1943), it was not further utilized except by Murata (1968), probably because in Japanese MLU is not as easily computed as in English, due to the continuous Japanese script, which makes a word count less obvious than for English.

Murata (1968) presents longitudinal MLU data of five children between 1;0 and 1;11, but does not provide any definition of the words (*go*) counted. In the 1990s several proposals for a Japanese MLU were discussed (Miyata 1999, 2012a; Ogura et al. 1997; Watamaki 1981, 1993). All of these versions can be performed by CLAN; however, none of them is standardized yet. The currently available results suggest that the average Japanese MLU curve resembles strongly its English counterpart.

2.2.2 DSSJ

Besides MLU, the Developmental Sentence Score (DSS) proposed by Lee (1974) can be computed with CLAN. The DSS command works with a set of language-specific scoring rules distributed with CLAN. DSS scores certain grammatical morphemes of eight grammatical subareas ('indefinite pronouns and noun modifiers', 'personal pronouns', 'main verbs', 'secondary verbs', 'negatives', 'conjunctions', 'interrogative reversals', and 'WH-questions') according to their complexity and average age of acquisition, thus measuring grammar development more directly than MLU. This division into eight areas makes it possible to extract detailed scores for grammatical subareas such as verb inflection or pronouns.

The Developmental Sentence Score for Japanese follows basically the same idea (DSSJ: Miyata et al. 2006, 2009, 2013, Miyata, Nisisawa, and Otomo 2005). But, as the language structure of English and Japanese is different in many aspects, a completely new set of grammatical areas and representative morphemes had to be developed. Using updated CHILDES corpora (Aki, Ryo, Tai, Arika, Nanami, Tomito, Asato, as well as the data from Taro (Kokuritsu Kokugo Kenkyūjo, 1982a, b) the first author and her colleagues selected grammatical items that were acquired in the same order for the eight children. The selected items were grouped in the following nine subareas: 1) verb last inflection, 2) verb middle inflection, 3) copula inflection, 4) conjunctions and conjunctive particles, 5) noun phrase structure and compounds, 6) case, topic, focus, and quotative particles, 7) adverbs, 8) sentence modality markers and formal nouns, and 9) final particles. Each subarea was divided into five developmental stages. For example, in the area of case particles, the nominative *ga* and locative *ni* were grouped into stage 1, while the accusative particle *o* was acquired later and therefore grouped into stage 3.

The resulting DSSJ Scoring Table was confirmed with a cross-sectional sample consisting of adult-child interactions of 84 children (31 boys and 53 girls) including six age groups ranging from 2;8 to 5;2, each group consisting of 14 children (Miyata et al. 2009, 2013). For each child, 100 utterances were analyzed. The high correlations of the children's overall DSSJ score with MLU and age in months indicated a high reliability of DSSJ, also in the higher age range. We also investigated in which subareas high-scoring children would excel, and it turned out that most

high-scoring children (defined as scoring higher than 1 SD than the mean DSSJ overall score) did not score highly in all subareas equally, but scored highly in various but different subareas. For the younger children between 2;8 and 3;8 there was a tendency to score high on finite verb inflection, conjunctions, and case particles, while most older children between 4;2 and 5;2 achieved high scores with conjunctions and noun phrases including compounds. This reflects the developmental tendency to progress from simple sentences with finite verbs and particles to complex sentence constructions using conjunctions and complex noun phrases.

This first evaluative study suggests that DSSJ may be valuable for studying grammatical development in both typical and non-typical children. A first comparison of the language development of children with pervasive developmental disorders and children with severe mental retardation with typically developing children showed that children with pervasive developmental disorders tend to score considerably lower than the typically developing and also the mentally retarded children (Miyata, Otomo, and Nisisawa 2007).

A recent development in CHILDES is the syntax tagger GRASP (Sagae et al. 2010), which computes grammatical dependency relations on the basis of the %mor tier. A Japanese version of GRASP has been released in 2010 (Miyata, Sagae, and MacWhinney 2013). The necessary library files are included in the JMOR folder mentioned above.

GRASP provides information on dependency relations in a sentence and also the case role of each arguments. Each word is tagged with its order in the sentence (first, second, third word, etc.), the number of the word from which it is dependent, and its syntactical role in the sentence (number|dependency|role). In Example 4, 1|3|JCT describes the adverb *yukkuri* ‘slowly’ as the first word in the sentence, standing in a junctive relation to the third word in the sentence, the main verb. The second word *miruku* ‘milk’ is the object of the main verb and is thus described as 2|3|OBJ. The verb is the ROOT of the sentence and its dependency is set to 0. The sentence ends with an exclamation mark, which is coded as PUNCT(uation) and is dependent of the main verb.

(4) *MOT:	yukkuri	miruku	nonde !
%ort:	いっくり	ミルク	飲んで !
%mor:	adv yukkuri=slowly	n miruku=milk	v:c nom-IMP:te=drink !
%gra:	1 3 JCT	2 3 OBJ	3 0 ROOT 4 3 PUNCT

This combination of morphological information on the %mor tier and syntactical information on the %gra tier makes possible complex analyses of argument structure in relation to the distribution of word types, inflections, and syntactic roles. Furthermore, the %gra tier can be used for the automatic computation of syntax development measures, such as the Index of Productive Syntax (IPSyn: Scarborough 1990) which

can be already computed by CLAN (Sagae, Lavie, and MacWhinney 2005). The development of a comparable syntax measure for Japanese is still awaited.

2.3 *kana kanji* script in CHILDES

In 1996, CHILDES switched from the limited 256-character ASCII code to Unicode, an international standard defining digital codes for virtually all existing scripts of the world. This rendered possible the use of the Japanese *kana kanji* script in CHAT transcriptions. In practice, a combination of the main utterance line in Hepburn-style augmented by a *kana kanji* version on a separate tier has proved functional (Example 5; based on Example 2), and is currently the prevailing CHILDES format for Japanese.

- (5) *MOT: kirinsan ga ohirugohan tabeta ne: .
 %ort: キリンさんがお昼ご飯食べたね ~.

With this format style, the transcript becomes more easily readable to the human researcher, and manual checks or coding are facilitated. Because it is the main line in Latin script that forms the basis for automatic computation, the entry format of the *kana kanji* tier (%ort) is relatively unrestricted and is equivalent to common book script. In many cases, an already existing *kana kanji* transcription is imported to a CHAT file as %ort, and a CHAT-format main line is added in Latin script. The drawback is of course the workload of a double transcription.

Alternatively, the use of *kana kanji* on the main line has become possible, too. In this case, the common *kana kanji* script needs to be adjusted to the CHAT format in the following way: Words have to be separated by single-byte spaces, and meta-linguistic characters like “~” for elongation have to be replaced by half-spaced CHAT symbols (e.g., ね: instead of ね ~). Also punctuation is restricted to single-byte characters (“.” instead of “。”; Example 6).

- (6) *MOT: キリンさんがお昼ご飯食べたね:.

As the switching from two-byte to single-byte characters during text entry is inconvenient, the CLAN text editor provides an automatic correction for spaces and punctuation. The transcriber types continuously in 2-byte mode, and the meta-characters are replaced automatically with their 1-byte counterparts when the file is saved. At present, *kana kanji* on the main line is not yet supported for JMOR, but it is possible to adapt the JMOR lexicon and grammar files to *kana kanji* input.

2.4 Phonetic script

For analysis of phonological development including disorders, the CHILDES system has created a second major tool called Phon, which works in compliance with the CHILDES XML data format. It supports International Phonetic Alphabet (IPA) transcriptions, media linkage, multiple blind transcription, automatic labeling of data such as syllabification, and systematic comparisons between actual and target phonological forms. Phon also provides a number of analysis commands, adapted specifically to the needs of phonological research. Built-in dictionaries of pronounced forms are available for Catalan, Dutch, British, and American English, French, German, Icelandic, Italian, and Spanish, but not yet for Japanese. Currently two Japanese corpora including nine children are available in Phon format. Phon-formatted data can be converted to CHAT format with the help of PhonTalk.

The use of Japanese data in the CHILDES framework is described in a self-teaching manual (Miyata et al. 2004), as well as in an online manual (Miyata 2012b). In addition to the explanations of the JCHAT format and convenient transcription utilities, an overview of the currently available Japanese data is provided. Also the production of video and audio links, coding and grammatical tagging, and the use of this information by CLAN are explained in detail. The use of Phon is explained in a separate Phon Manual.

3 The impact of CHILDES on Japanese language acquisition research

CHILDES combines the advantages of longitudinal and cross-sectional corpora. Longitudinal data provide reliable, rich data that permits the study of long-term changes in individual development. Cross-sectional data from a large number of participants permits the study of differences between acquisitional patterns, social groups, and clinical types. The ready availability of reliable media-linked data that are already tagged for morphology, syntax, conversational analysis, or phonology information, and the existence of tagging and coding schemes for a range of purposes, make analyses possible that far exceed simple word frequency counts.

3.1 Main corpora

The first research to utilize CHILDES for Japanese data was Morikawa (1987), who computerized parts of the monumental Noji Corpus (Noji 1973–1977) for her doctoral dissertation on case particle acquisition. This corpus, consisting of diary notes of Noji's son Sumihare born in the 1950s, had been available in printed form, but was

Table 1: List of Publically Available Japanese CHILDES Corpora (as of February 2013)

Child-Parent Conversations		
Corpus Name	Child (Age)	Creator (Year)*
Hamasaki	Tar (2;2–3;4)	Hamasaki (2004)
Ishii	Jun (0;6–3;8)	Ishii (2004)
MiiPro – ArikaM	ArikaM (3;0–5;1)	Nisisawa and Miyata (2010)
MiiPro – Asato	Asato (3;0–5;0)	Miyata and Nisisawa (2009)
MiiPro – Nanami	Nanami (1;2–5;0)	Nisisawa and Miyata (2010)
MiiPro – Tomito	Tomito (2;11–5;1)	Miyata and Nisisawa (2009)
Miyata – Aki	Aki (1;5–3;0)	Miyata (2004a)
Miyata – Ryo	Ryo (1;3–3;0)	Miyata (2004b)
Miyata – Tai	Tai (1;5–3;1)	Miyata (2004c)
Noji	Sumihare (0;0–6;11)	Noji, Naka, and Miyata (2004)
Okayama	130 children between 2;0 and 4;11	Okayama, Miyata, Shirai, and Sakazaki (2013)
Special Corpora		
Corpus Name	Child (Age)	Creator (Year)*
Bilingual – Hayashi	Anders (0;12–2;5) Japanese-Danish	Hayashi (2004)
CA – Sakura	18 conversations of groups of 4 students	Miyata, Banno, Konishi, Matsui, Matsumoto, Ōki, Takahashi, and Muraki (2009)
Frogs – Inaba	90 children 3;0–11;0; 48 JL1 adults; 50 JL2 adults	Inaba (2014)
PhonBank – Ota	Hiroimi (1;0–2;0); Kenta (1;5–2;6); Takeru (1;4–2;0)	Ota (2008)

not readily used due to its sheer size: the four volumes contain Sumihare's utterances from birth to his seventh birthday, complete with contextual notes. The utterances (without the contextual notes) were published in CHILDES in 2004.

The Japanese database is continuously growing (see Table 1; a more detailed description can be found in the online manual; Miyata 2012b). One of the most frequently used corpora up to now is the Miyata corpus, published between 1995 and 2000. It includes weekly mother-child interactions of three boys (Aki, Ryo, and Tai) between 1;5 and 3;0, who were living in the Nagoya area. The transcripts of Tai are supplied with audio links. As mentioned above, media linkage grants a higher reliability of the transcripts, and most recent corpora are now linked to audio or video files. For example, the Ishii Corpus, published in 2004, is a video-linked corpus of father-child conversations of the boy Jun (0;6–3;8) who was raised in Kyoto. Similarly, the MiiPro Corpus (2009, 2010) includes audio-linked conversational data

of two girls (Arika and Nanami) and two boys (Asato and Tomito) living in the same neighborhood in Tokyo. The data cover the age span between 1;2 and 5;0, although at present, only the data between 3;0 and 5;0 are publicly available. (See Table 1: Child-Parent Conversations.)

Audio-linkage in combination with the Phon format also facilitates phonetic research. For example, the Ota Corpus (2008) includes orthographic as well as phonetic transcriptions of the utterances of the girl Hiromi (1;0-2;0), and the boys Kenta (1;5-2;6) and Takeru (1;4-2;0). (See Table 1: Special Corpora.)

Other recently added corpora are the Sakura Corpus (2009), the Inaba corpus (2014) and the Okayama corpus (2013). The Sakura Corpus consists of 18 twenty-minute conversations of four college students in various gender combinations. The Inaba Corpus is an audio-linked collection of frog story narrations from 90 children between 3;0 and 11;0, 48 Japanese adults, and 50 second language speakers of Japanese (English native) with proficiency level 1 to 5. Also the English versions of the story are included.

The Okayama Corpus includes data from 130 mother-child pairs in the Osaka region between 1969 and 1971. The data cover all utterances between the child and his or her mother during one whole day, and were collected by Okayama's students with the help of handwritten notes and tape recordings.

3.2 Research based on CHILDES data

Around 1995, when after the first CHILDES workshop took place in Japan, a growing number of research presentations and papers on Japanese language acquisition utilizing CHILDES started to appear. In the beginning, researchers relied on the CHAT format and the CLAN programs to collect new corpora to address their research questions. More recently, the availability of large quantities of fully transcribed data has made it possible for researchers to conduct interesting analyses without having to collect new corpora. But this ability to conduct analyses directly from existing corpora does not mean that researchers will stop collecting new data. Instead, we expect that, going forward, researchers will rely on both new corpus collection and the analysis of existing corpora. The research review below summarizes research using data from the CHILDES database, as well as unpublished data in CHAT-format collected by the respective author, where no corpus name is mentioned.

3.2.1 Research on case and argument structure

A great proportion of research using CHILDES dealt with the acquisition of case and argument structure. Morikawa (1987, 1997) investigated how Sumihare (Noji Corpus) started to use case particles with transitive and intransitive verbs. Nishibu (1998,

2000) investigated the use of the nominative case particle *ga* with Aki from the Miyata Corpus and Yū, a boy aged 1;6-3;0 observed by Nishibu herself. Matsuoka (1998a, 1998b, 2001) studied the acquisition of the case particles *ga* (nominative), *o* (accusative), and especially *ni*, which is used as dative case particle and as locative postposition, on the basis of the speech data of Aki, Sumihare (Noji Corpus), and her own data from a boy called Kan. Similarly, Sugisaki (2011) investigated the difference of case particles and postpositions in the course of acquisition (Sugisaki, 2011) using the data of Aki and Tai from the Miyata Corpus, and Sugisaki (2005, 2008) focused on word order parameter setting including the third child, Tai, from the Miyata Corpus. Tanaka (2011) and Tanaka and Shirai (in press) investigated word order, case particles, and animacy as cues for argument structure in the speech data of Asato and Arika (MiiPro Corpus) and their mothers.

Miyamoto et al. (1999) focused on the high omission rate of the case particles *ga*, (nominative), *o* (accusative), and the topic particle *wa* using the Aki corpus. Also Hirakawa, Oshima, and Itoh (2009) investigated the omission pattern of the nominative case particle *ga* in an unnamed girl aged 2;1–2;11, whose data were transcribed in CHAT format. Guerriero, Oshima-Takane, and Kuriyama (2006) investigated the distribution of null-argument, pronominal argument and lexical argument in English and Japanese data from a discourse-pragmatic angle including pointing and gaze utilizing the coder mode of CLAN format. Also Fujimoto (2008), who analyzed the data of Aki, Ryo, and Tai, took a pragmatic look at the early use of case and topic particles. Kayama (2006) conducted an experimental study (transcribed and coded in CHAT format) with from ten Japanese-speaking children between 2;5 and 4;0 concerning the children's interpretation of null-arguments.

3.2.2 Research on attributive phrases and clauses

Also, relative clauses and attributive phrases were investigated intensively. Ozeki (2005, 2008) and Ozeki and Shirai (2005, 2007a, 2007b, 2010) explored the acquisition of relative clauses comparing the data from Aki, Ryo, Tai, Sumihare (Noji Corpus) and Taro (Kokuritsu Kokugo Kenkyūjo, 1982a, b) to Korean data. Sugisaki (2010) analyzed the input for the same data (Aki, Ryo, and Tai) from a generative point of view, focusing on the different structure of English and Japanese relative clauses. Murasugi, Nakatani, and Fuji (2011) reinvestigated the overuse of the genitive case particle *no* in attributive clauses and the acquisition of attributes, based on the data of Jun (Ishii corpus [see Table 1]) and Sumihare from the CHILDES database, and a third boy called Yuta whose data were collected by the authors.

3.2.3 Research on complex predicates and compound nouns

Miyoshi (1999) explored the timing of the acquisition of complex predicates and compound nouns by Aki from a UG point of view. Also, Murasugi (2011) investigated

frequently produced typical grammatical errors in a parameter framework, on the basis of Sumihare's speech data, especially case marking errors, overgeneration of the complementizer *no*, root infinitive analogues (the early use of past tense *-ta* in volitional contexts) and verb inflection errors involving problems with transitivity and causativity.

3.2.4 Research on verb types and verb inflection

Other studies on grammar acquisition focused on verb types and verb inflection. Nomura and Shirai (1997) investigated the proportion of intransitive and transitive verbs on the basis of CHAT-formatted observational data of one Japanese-speaking boy and his mother. Fuji (2006) and Murasugi, Hashimoto, and Fuji (2007) investigated the acquisition of transitivity, intransitivity, nonaccusativity, and causativity on the basis of Sumihare's speech data. Also, Fukuda and Choi (2010) compared the proportion of transitive verbs, intransitive verbs, and adjectives in the speech Aki, Ryo, Tai, and Jun to the data of four Korean-speaking children and their mothers.

3.2.5 Research on tense and aspect

The acquisition of tense and aspect was a topic in first language as well as in second language acquisition. Shirai (1994, 1995) examined the developmental changes of tense-aspect marking in adult learners of Japanese, while Shirai (1998) and Shirai and Li (2000) compared the acquisition of tense and aspect of three children, namely Aki, Taro (Kokuritsu Kokugo Kenkyūjo, 1982a, b), and the a third child named Yotchan, who had been observed by Patricia Clancy. Shirai and Suzuki (2012) further analyzed the factors determining the acquisition of aspect including verb type and input frequency on the basis of the Tar, Jun, and Ryo Corpora. Shirai and Miyata (2006) focused on the acquisition of the past tense morphology on the basis of Aki, Ryo, and unpublished diary data of a girl called Kī by Masayuki Yokoyama. A follow-up study by Kubo and Suwa (2008) reanalyzed the past tense use of Aki, Ryo, Tai, proposing an additional third step in the development. Kubo (2009) contrasted the development of past tense use of by the three children to the acquisitional process of English-native L2 learners of Japanese.

Other studies dealt with the acquisition causative, negation and other verb inflections. Shirai et al. (2000, 2001) explored the acquisition of the causative combining conversational data from Tai, diary data from the above mentioned diary study of Kī collected by Yokoyama, and cross-sectional data from the Okayama Corpus. Kubota (2011a, b) investigated the acquisition of negation using the Jun Corpus, especially focusing on the effects of dialectal variations in the input (Kansai dialect

-*hen* vs. Tokyo dialect -*nai*). Klafehn (2004) focused on morphological errors occurring during the acquisition of verb inflection using the Aki, Ryo, and Tai corpora.

3.2.6 Research on early vocabulary: Verbs, nouns, and verbal nouns

A great number of studies focused on the characteristics of early vocabulary, especially verbal nouns, and the proportion of verbs and nouns. For example, Yamashita (1999) examined the composition of the early vocabulary of two Japanese-speaking children and their mothers, comparing the acquisition rate of noun, verbs, and verbal nouns. Oshima, Miyata, and Naka (2000) compared the early vocabulary composition and maternal input of two English-speaking and two Japanese-speaking (Tai and Ryo) children, especially focusing on the verbal and nominal use of English deverbal nouns (e.g., *I drink milk* vs. *Did you get a drink already?*) and Japanese verbal nouns (e.g., *Jon kara denwa ga atta* ‘There was a phone call from John’ vs. *Denwa ga otita* ‘The phone has fallen down’). Miyata, Oshima-Takane, and Nisisawa (2004) analyzed the early vocabulary of four children and their mothers (MiiPro corpus). Miyata (2012c) reinvestigated the vocabulary of two of the four MiiPro children, Nanami and Arika, who had displayed an extremely high, respectively low, noun bias. Ogura (2006) and Ogura et al. (2006) examined the role of the situation for the frequency of verbs and nouns using cross-sectional data of 31 children between 1;0 and 2;0 in book-reading and in toy-play situations. The same data were used in their study of the connection between lexical and grammatical development as measured by MLU (Ogura et al. 1997), and in Ogura, Yamashita, and Tsubota (1997) and Ogura (2006), who they focused especially on the use and function of baby-talk words. Suzuki (2009, 2013) investigated the acquisition of verbal nouns on the basis of the Aki, Ryo, Tai, Tar, Jun, and Sumihare Corpora. She concentrated on the syntactical frame in which early baby talk verbal nouns appeared, highlighting the acquisition process of transitive and intransitive verbal nouns (*nainai [suru]* ‘[do] putting away’ vs. *nenne [suru]* ‘[do] sleeping’).

3.2.7 Research on pragmatic functions

A number of studies focused on the pragmatic aspects functions of language acquisition. Itoh and Oshima-Takane (2004) and Itoh (2008) investigated the acquisitional process of deictic words (so-called *ko-so-a* words) on the basis of the speech data from Aki, Ryo, and Tai. Itoh (2006, 2008) compared these results to the developmental data obtained from autistic and high-functioning autistic children. Guerriero, Oshima-Takane, and Kuriyama (2006) compared focused on the pragmatic use of deictics, in comparison to lexical referents and null-arguments, using CHILDES-

formatted data by of six English- and six Japanese-speaking children and their mothers at two time points, 1;9 and 3;0.

Kubota (2000) examined the developmental changes in the turn-taking pattern of a toddler and his mother. Kubota (2010) concentrated on the responses to clarification requests by Jun and an additional boy comparing them to data from English-speaking children. Hamasaki and Shirai (2000) investigated the use of clarification requests in a two year-old girl named Kokoro. Kubota (2010) concentrated on the responses to clarification requests by Jun and an additional boy, comparing them to data from English-speaking children. Hamasaki (2003) investigated the timing of Y/N answers of three children (Tai, Tar, and the aforementioned girl Kokoro), by analyzing the time information of the audio links.

Kasuya and Uemura (2005, 2011) investigated triadic family interactions between each of the parents and two siblings of nine families at two time points when the younger child was 2;7 and 3;1. Tsuji and Stainthorp (2008) focused on the communication style of the mothers of 10 children between 1;1 and 2;1. Kurumada and Iwasaki (2011) focused on the functions of *ii* 'good' in mother-child conversations of Aki, Ryo, and Tai. Miyata and Nisisawa (2007) examined the emergence of backchanneling behavior of Tai, and Nomura (2007) focused on the pragmatic aspects of postposing using the Tai and the Jun corpora.

The Theory of Mind (ToM) is defined as the ability (1) to attribute mental states, such as beliefs, intents, desires, pretending, and knowledge to oneself and others, and (2) to understand that others may have different beliefs, desires, and intentions from one's own. Matsui, McCagg, and Yamamoto (2005) and Yamamoto, Matsui, and McCagg (2005) investigated the use of *datte* 'but, after all' by Tai in the frame of the child's developing a ToM. As *datte* is used in situations where the speaker disagrees with some other opinion, this shows that children understand that people can have differing opinions. In an additional experiment, they examined the use of *datte* by 16 preschool children in comparison to their results in a ToM false-belief test. Matsui, Yamamoto, and McCagg (2006) further extended their study to Aki and Ryo, and examined the use of mental verbs and final particles expressing certainty (*sitte iru* 'I know', assertive particle *yo*) versus verbs and particles expressing uncertainty (*omou* 'I think', doubt expressing particle *kanaa*), and direct knowledge (*miru* 'I see'; assertive particle *yo*) versus hearsay (*kiku* 'I hear', quotative particle *tte*).

Other research focused on how language typology affects the acquisition of the concept of number. Sarnecka et al. (2007) conducted a cross-linguistic study on the acquisition of the numbers one, two, three by children between 2;6 and 3;6 acquiring Japanese, Russian or English, investigating the influence of the availability of singular/plural inflections. All data were derived from CHILDES; the Japanese data included Aki, Ryo, Jun, and Sumihare, and their mothers, as well as experimental data including 48 Japanese children between 2;9 and 3;6.

3.2.8 Research on narratives and book reading

Pragmatic studies that use CHILDES-formatted data also include research on narration and book reading. Minami (1994, 1995) and Minami and McCabe (1995) explored cross-linguistic and cross-cultural differences in the way caretakers elicit narratives about past events by using an unpublished corpus of 8 Japanese- and 8 English-speaking preschool children and their mothers. Minami (1996a, b, 1997, 1998, 2001, 2002a, b) focused on the development of the children themselves analyzing narratives of past events (“injury”) of 10 four-year-old and 10 five-year-old children.

Minami further applied Labovian methodology (Labov 1972, 1997) to L2 and bilingual narrative development. Minami (2006, 2009) examined the past event narratives of 32 second-language learners of Japanese in comparison to adult native speakers of Japanese. Likewise, focusing on 40 English-Japanese bilingual children’s narrative development, Minami (2008, 2011) examined narrative contents, narrative marking such as the use of the past tense, and cohesive referencing devices. Extending his research to a bilingual and multicultural context, Minami illustrated that narrative characteristics vary by language and culture and that bilingual children’s narratives reflect the culture learned at home often even when they are using another language.

When it comes to the development of children’s language skills, oral narratives in particular serve as the platform for transition into literacy. In terms of the orality-literacy continuum, Minami (2000a, 2001) investigated the book reading style of Japanese mothers towards their preschool children based on data of 20 mother-child dyads, comparing the amount of immediate (e.g., labeling) and non-immediate talk (real world connections and explanations) and turn sequences.

3.2.9 Research on phonology

The advent of Sonic Chat in combination with the Phon program also rendered possible phonological studies. Ota (1998, 1999, 2001, 2003) investigated the phonological development from the viewpoint of Optimality Theory. Optimality Theory (Prince and Smolensky 2004) is a general model of how grammars are structured. The theory’s central idea is that surface forms of language reflect resolutions of conflicts between competing constraints. Based on a rich database from nine children including Aki, Ryo, Tai, Sumihare from the CHILDES database, Taro (Kokuritsu Kokugo Kenji Kenkyūjo 1982a, b), and the girl Y followed by Ai Okubo, as well as subsequently published data of the three children Hiromi, Kenta, and Takeru, he investigated the prosodic characteristics and phonological errors of the children. In Ota (2006, 2013), he explored the relationship between word truncation rate by the children and the frequency of the corresponding word in maternal speech.

4 Current Trends at Japanese CHILDES: Challenges and Perspectives

4.1 Advantages and possibilities

As we have reviewed in the previous section, the high number of CHILDES related research articles shows the enormous impact of CHILDES on acquisitional research. The slightly outdated *chldesbib.pdf* list (available at <http://talkbank.org/usage/>) includes 3104 publications up to 2008). In our view, CHILDES is especially successful because it responds to the demands of a) reliability, b) replicability, c) variety and flexibility, and d) commitment to data sharing.

a) Reliability

The use of computational transcription aides enhances the quality of transcripts and helps to eliminate errors like typing mistakes. The easy access to the media allows direct checking and correcting of questionable transcriptions. Furthermore, audio/video linkage allows every user to access the original sound data and judge by herself, thus making the analysis more reliable. And of course, the reliability of research results rises considerably when the speech data used in that research are published afterwards and become freely accessible to everyone. And last but not least, the sheer amount of data minimizes the influence of random transcription errors on the analysis.

b) Replicability

Replicability of results is another important requirement in scientific research. The publication of the data, on which a given research analysis is based, permits an exact replication of the research procedure, better control of various factors influencing the analysis results, and the extension to other data.

c) Variety

First of all, the variety of languages covered by CHILDES allows more and more sophisticated cross-linguistic analysis based on large speech corpora, like for example the article on the influence of language type on number acquisition mentioned above (Sarnecka et al. 2007). Equally important is the variety of linguistic research approaches. Speech data are analyzed from various angles: grammatical, phonological, semantic, gestural, mimetic research, analysis of sign language and bilingual data, conversational analysis, and so forth. All these areas can profit enormously from specifically tailored computer tools. CHILDES responds to these needs by the flexible incorporation of sub-programs like *Phon* or *Grasp*, developed by members of the CHILDES community, and the support of standard coding and annotation systems like CA coding or syntax coding schemes. CHILDES is also coping with the difficult task of making all the programs and schemes mutually compatible.

d) Commitment to data sharing

CHILDES is a non-profit research system that is based largely on voluntary contributions from researchers and support from public funds. All corpora and programs are freely available to the public, and personal support is provided at no charge. The free and easy access via the Internet renders possible the use of the system by researchers and students all over the world who would not be able to afford a fee-based usage, and facilitates linguistic research already on the undergraduate level.

The core principle underlying the whole system is the expectation that researchers who have been supported through public and university funds and who have used CHILDES programs and data, should eventually contribute their data, the corresponding media, and newly developed annotation schemes or programs to CHILDES. Funding agencies and professional societies now uniformly agree that data collected with public funding should be made available to the public. To facilitate this process, CHILDES provides a flexible frame for data publication (including a citation format that makes a corpus publication equal to other written papers), and provides technical updates and maintenance to already published corpora. It is remarkable how many of the studies mentioned in the research review above used CLAN with data that have not yet been contributed to CHILDES. Encouraging the publication of these “sleeping” data is a major task for the near future. Inclusion of these data in CHILDES may require increased support for data publication and readily available help in use of CLAN for transcription and linkage to media.

4.2 Challenges

A serious drawback of any speech database is the workload of data entry. In the case of Japanese, the typing process takes much more time, because of the *kana kanji* selection procedure (*moji henkan*). When we include the time for typing of an additional Latin script tier, the number of keystrokes increases fivefold compared to Latin script.¹ Of course, any adding of CHAT symbols or codes and tags takes additional time. Although this process is considerably assisted by an array of entry utilities, the transcription time is unlikely to shrink unless reliable automatic speech recognition becomes more generally available. Nevertheless, the number of Japanese corpora keeps growing, and at present (September 2013) 13 Japanese corpora containing a total of 1,103 files and 2,218,290 words are available.

Another challenge for CHILDES in Japan is the language barrier posed by the use of English as a medium for CHILDES: its homepage, the manuals, and the CLAN interface are only available in English. This poses a barrier to Japanese scholars

¹ When typing Example 1, for example, the number of keystrokes is 13 in Latin script, and 37 (42) in *kana kanji* script without or with spaces, respectively. The stroke rate can be much higher according to the specific words used in the sentence.

that should not to be underestimated. In the research review about it was striking that most studies were performed by English-Japanese bilingual researchers either located in an English speaking country, and/or having an international background, and a rather high number of studies deals with English-Japanese L2 or bilingual data. Although a Japanese version of the CLAN Manual was early available and updated several times later on (Oshima-Takane and MacWhinney 1995; Oshima-Takane et al. 1998; Miyata et al. 2004; Nomura 2008, Miyata 2012b), the use of CHILDES is not as popular as might be expected. For a future expansion of the Japanese section of CHILDES it is indispensable to make the access to CHILDES easy enough to be used spontaneously by students at undergraduate and postgraduate level. Intensified publicity efforts, including the use of social media like Wikipedia and Facebook, might be effective as well.

Overall, it can be summarized that CHILDES in Japan has developed in many ways, despite the problems posed by a continuous non-Latin script. Several computer tools facilitating data entry and analysis have been developed especially for Japanese, and new Japanese corpora are steadily being published. Nevertheless, the amount of data available is still far from being sufficient.

By way of summary, we can conclude that CHILDES in Japan has developed in many important ways, despite the problems posed by a continuous non-Latin script. Researchers now have powerful computer tools for facilitating data entry and analysis, and these tools have been customized specifically for Japanese. The major current weaknesses in CHILDES for Japanese are not technical ones involving the programs, but limitations in the size and coverage of the database. Although the database continues to grow, the pace of this growth has not kept up with the demands of modern day corpus linguistic analysis, which requires increasingly larger samples from a great number of children across a longer age range in a greater variety of social situations. Research results analyzing a larger number of Japanese children over a longer period of time is still sparse. Furthermore, research based on the Japanese CHILDES corpora has often combined one or two children from the database with the researcher's own unpublished data. This means that published results are often based in part or entirely on unpublished data. Until the data for such analyses is made publicly available, the scientific basis for Japanese language acquisition research remains insecure. In other words, Japanese acquisition research has not yet entered the age of "big data".

The core problem here is the unwillingness of Japanese child language researchers to make their data publicly available. In our view, the research community needs to consider data publication as the standard procedure, rather than as an optional process. This is particularly true for research supported by national grants. Making the results of these studies available to the research community, under password protection if necessary, would greatly enhance the reliability of research results, while laying the foundation for the advent of a real database age in the study of Japanese language learning.

References

- Brown, Roger. 1973. *A first language*. Cambridge, MA: Harvard University Press.
- Coulmas, Florian. 1989. *The writing systems of the world*. Malden, MA: Blackwell.
- Fuji, Chisato. 2006. Two types of causatives in Japanese and Japanese sign language: A study in syntax and acquisition. Nagoya: Nanzan University master thesis.
- Fujimoto, Mari. 2008. L1 acquisition of Japanese particles: A corpus-based study. New York: The City University of New York dissertation.
- Fukuda, Shin and Soonja Choi. 2010. The acquisition of transitivity in Japanese and Korean children. In Shoichi Iwasaki, Hajime Hoji, Patricia M. Clancy and Sung-Ock Sohn (eds.), *Japanese Korean Linguistics* 17, 613–624. Stanford, CA: CSLI Publications.
- Guerriero, A. M. Sonia, Yuriko Oshima-Takane and Yoko Kuriyama. 2006. The development of referential choice in English and Japanese: a discourse-pragmatic perspective. *Journal of Child Language* 33(4), 823–857.
- Hamasaki, Naomi. 2003. The timing-shift of two-year-old's responses to caretaker's yes/no questions. In Yasuhiro Shirai, Hiromi Kobayashi, Susanne Miyata, Kei Nakamura, Tamiko Ogura and Hidetosi Sirai (eds.), *Studies in Language Sciences* (2), 193–206. Tokyo: Kurosio Publishers.
- Hamasaki, Naomi and Hidetoshi Shirai. 2000. A contextual analysis of a Japanese two-year-old's clarification requests. In Eve V. Clark (ed.), *The Proceedings of the Thirtieth annual Child Language Research Forum*, 179–186. Stanford, CA: Center Study Language and Information.
- Hirakawa, Makiko, Yuriko Oshima-Takane and Keiko Itoh. 2009. Case omission in early child language. In Shunji Inagaki, Makiko Hirakawa, Setsuko Arita, Yasuhiro Hirakawa, Hiromi Morikawa, Mineharu Nakayama, Hidetosi Sirai and Jessica Tsubakita (eds.), *Studies in Language Sciences* (8), 79–91. Tokyo: Kurosio Publishers.
- Itoh, Keiko. 2006. Shijishi ko, so, a no shutsugen kara mita kōkinō jiheishōji ni okeru goyōronteki kinō no tokuchō [Characteristics of the pragmatic functions of the ko/so/a deictic words with high-functioning autistic children]. *Japanese Journal of Communication Disorders* 23(3), 169–178.
- Itoh, Keiko. 2008. *Jiheishōji no goyōronteki nōryoku ni kansuru jissōteki kenkyū* [Empirical research on the pragmatic abilities of autistic children]. Tokyo: Kazama Shobo.
- Itoh, Keiko and Yuriko Oshima-Takane. 2004. Shijishi ko, so, a no shutsugen junjo o kitei suru yōin [Determinants of developmental order of Japanese ko/so/a deictic words]. *Japanese Journal of Communication Disorders* 21(1), 1–14.
- Kasuya, Hiroko and Kayoko Uemura. 2005. Forms of parental directives in triadic family interactions. In Masahiko Minami, Kobayashi, Harumi, Mineharu Nakayama and Hidetosi Sirai (eds.), *Studies in Language Sciences* (4), 119–135. Tokyo: Kurosio Publishers.
- Kasuya, Hiroko and Kayoko Uemura. 2011. Children's self-talk as internal dialogue in the context of triadic parent-sibling interaction. In Setsuko Arita, Yuko Goto Butler, Eric Hauser, Kaoru Horie, Reiko Mazuka, Yasuhiro Shirai and Jessica Tsubakita (eds.), *Studies in Language Sciences* (10), 79–95. Tokyo: Kurosio Publishers.
- Kayama, Yuhko. 2006. The L1 acquisition of Japanese null objects in discourse: a preliminary study. In Mineharu Nakayama, Masahiko Minami, Hiromi Morikawa, Kei Nakamura and Hidetosi Sirai (eds.), *Studies in Language Sciences* (5), 55–73. Tokyo: Kurosio Publishers.
- Klafehn, Terry. 2004. Japanese verbal inflection: words and rules or words and words? In Masahiko Minami, Harumi Kobayashi, Mineharu Nakayama and Hidetosi Sirai (eds.), *Studies in Language Sciences* (3), 103–120. Tokyo: Kurosio Publishers.
- Kokuritsu Kokugo Kenkyūjo. 1982a. *Yōji no kotoba shiryō (3): Issaiji no kotoba no kiroku* [Child Language Data (3): A Record of Language by a One-year-old]. Tokyo: Shuei Shuppan.

- Kokuritsu Kokugo Kenkyūjo. 1982b. *Yōji no kotoba shiryō (4): Nisaiji no kotoba no kiroku* [Child Language Data (4): A Record of Language by a Two-year-old]. Tokyo: Shūei Shuppan.
- Kubo, Kazumi and Michiko Suwa. 2008. Early use of the past marker *-ta* in L1 speakers of Japanese. In Timothy Jowan Curnow (ed.), *Selected papers from the 2007 Conference of the Australian Linguistic Society*. <http://www.als.asn.au/proceedings/als2007/kubosuwa.pdf> (accessed 5 November 2012).
- Kubo, Kazumi. 2009. The acquisition of the meanings and uses of the past form *-ta* by first and second language learners of Japanese. Perth: University of Western Australia dissertation.
- Kubota, Mihoko. 2000. Development of a Japanese two-year-old's conversational skills through turn-taking with her mother. In Yuriko Oshima-Takane, Yasuhiro Shirai and Hidetosi Sirai (eds.), *Studies in Language Sciences* (1), 135–143. Nagoya: Chukyo University.
- Kubota, Mihoko. 2010. An English-Japanese comparative study of clarification responses of parent-child dyads. In Makiko Hirakawa, Shunji Inagaki, Setsuko Arita, Yuko Goto Butler, Kaoru Horie, Eric Hauser, Yasuhiro Shirai and Jessica Tsubakita (eds.), *Studies in Language Sciences* (9), 77–92. Tokyo: Kurosio Publishers.
- Kubota, Mihoko. 2011a. A case study of the acquisition of the negative expression *X to chigau*. In Kyōko Sato, Hiroko Ikawa, Yoshie Suzuki, Takako Furuya, Akemi Matsuya, Haruko Miyakoda and Yoshiko Morita (eds.), *Kotoba no shinjitsu o mitsumete: Gengo kenkyū no riron to jissō* [Watching linguistic facts: Theory and practice of linguistic studies], 251–263. Tokyo: Kaitakusha.
- Kubota, Mihoko. 2011b. Aru yōji no dōshi keiyōshi hiteikei no shūtoku: Hyōjungo to Kyōtoben no heiyō kara [A child's acquisition of verbal and adjectival negative forms in the standard form and Kansai dialect of Japanese]. *Proceedings of the Eleventh Annual Meeting of the Japanese Cognitive Linguistics Association* 11, 512–518.
- Kurumada, Chigusa and Shoichi Iwasaki. 2011. Negotiating desirability: The acquisition of *ii* 'good' in mother-child interactions in Japanese. In Ho-Min Sohn, Haruko Minegishi Cook, William O'Grady, Leon A. Serafim and Sang Yee Cheon (eds.), *Japanese Korean Linguistics* 19, 511–525.
- Labov, William. 1972. *Language in the inner city: Studies in the Black English vernacular*. Philadelphia, PA: University of Pennsylvania Press.
- Labov, William. 1997. Some further steps in narrative analysis. *Journal of Narrative and Life History* 7(1–4). 395–415.
- Lee, Laura L. 1974. *Developmental Sentence Analysis. A grammatical assessment procedure for speech and language clinicians*. Evanston: Northwestern University Press.
- MacWhinney, Brian. 2000. *The CHILDES project: Tools for analyzing talk*, 3rd edn. Mahwah, NJ: Lawrence Erlbaum. <http://childes.psy.cmu.edu/> (accessed 5 November 2012).
- Masuoka, Takashi and Yukinori Takubo. 1995. *Kiso Nihongo Bunpō 2nd Edn*. [Basic Japanese Grammar]. Tokyo: Kurosio Publishers.
- Matsui, Tomoko, Peter McCagg and Taeko Yamamoto. 2005. Little persuaders: Japanese children's use of *datte* and their developing theory of mind. In Andrea E. Tyler, Mari Takada, Yiyoung Kim and Diana Marinova (eds.), *Language In Use: Cognitive and Usage-based Approaches to Language and Language Learning. Selected papers from Georgetown University Roundtable on Languages and Linguistics 2003*, 36–49. Washington, DC: Georgetown University Press.
- Matsui, Tomoko, Taeko Yamamoto and Peter McCagg. 2006. On the role of language in children's early understanding of others as epistemic beings. *Cognitive Development* 21, 158–173.
- Matsuoka, Kazumi. 1998a. The acquisition of Japanese case particles and the theory of case checking. Storrs, CT: University of Connecticut dissertation.
- Matsuoka, Kazumi. 1998b. The proto-postposition stage in the acquisition of the Japanese particle *ni*. Memphis, TN: University of Memphis.
- Matsuoka, Kazumi. 2001. The acquisition of the Japanese case particle *ni*. In Mineharu Nakayama (ed.), *Issues in East Asian language acquisition*, 129–145. Tokyo: Kurosio Publishers.

- Minami, Masahiko. 1994. English and Japanese: Cross-cultural comparison of parental styles of narrative elicitation. *Issues in Applied Linguistics* 5(2), 383–407.
- Minami, Masahiko. 1995. Long conversational turns or frequent turn exchanges: Cross-cultural comparison of parental narrative elicitation. *Journal of Asian Pacific Communication* 6(4), 213–230.
- Minami, Masahiko. 1996a. Japanese preschool children's and adults' narrative discourse competence and narrative structure. *Journal of Narrative and Life History* 6, 349–373.
- Minami, Masahiko. 1996b. Japanese preschool children's narrative development. *First Language* 16(3), 339–363.
- Minami, Masahiko. 1997. Cultural constructions of meaning: Cross-cultural comparisons of mother-child conversations about the past. In Charlotte Mandell and Allyssa McCabe (eds.), *The problem of meaning: Cognitive and behavioral approaches*, 297–345. Amsterdam: North-Holland.
- Minami, Masahiko. 1998. Politeness markers and psychological complements: Wrapping-up devices in Japanese oral personal narratives. *Narrative Inquiry* 8(2), 351–371.
- Minami, Masahiko. 2000. Book reading styles of Japanese mothers. In Yuriko Oshima-Takane, Yasuhiro Shirai and Hidetosi Sirai (eds.), *Studies in Language Sciences* (1), 145–156. Toyota: Chukyo University.
- Minami, Masahiko. 2001. Maternal styles of narrative elicitation and the development of children's narrative skill: A study on parental scaffolding. *Narrative Inquiry* 11 (1), 55–80.
- Minami, Masahiko. 2002a. *Culture-specific language styles: The development of oral narrative and literacy*. Clevedon, England: Multilingual Matters.
- Minami, Masahiko. 2002b. Narrative as a reflection of culture and consciousness: Developmental aspects. In Ray T. Donahue (ed.), *Exploring Japaneseness: Japanese enactments of culture and consciousness*, 241–261. Westport, CT: Ablex/Greenwood Publications.
- Minami, Masahiko. 2006. The development of narrative structure in the acquisition of Japanese as a second language. In Mineharu Nakayama, Masahiko Minami, Hiromi Morikawa, Kei Nakamura and Hidetosi Sirai (eds.), *Studies in Language Sciences* (5), 191–206. Tokyo: Kurosio Publishers.
- Minami, Masahiko. 2008. Telling good stories in different languages: Bilingual children's styles of story construction and their linguistic and educational implications. *Narrative Inquiry* 18(1), 83–110.
- Minami, Masahiko. 2009. An analysis of narrative communication strategies used by Japanese-as-a-foreign-language learners. *Journal of Japanese Linguistics* 25, 1–15.
- Minami, Masahiko. 2011. *Telling stories in two languages: Multiple approaches to understanding English-Japanese bilingual children's narratives*. Charlotte, NC: IAP-Information Age Publishing.
- Minami, Masahiko and Allyssa McCabe. 1995. Rice balls and bear hunts: Japanese and North American family narrative patterns. *Journal of Child Language* 22, 423–445.
- Miyamoto, Edson T., Kenneth Wexler, Takako Aikawa and Shigeru Miyagawa. 1999. Case-dropping and unaccusatives in Japanese acquisition. In Annabel Greenhill, Heather Littlefield and Cheryl Tano (eds.), *Proceedings of the 23rd Boston University Conference on Language Development*, 443–452. Somerville, MA: Cascadilla Press.
- Miyata, Susanne. 1999. Assigning MLU stages for Japanese. *Journal of Educational Systems and Technologies* 9, 81–92. The Audio Visual Center, Chukyo University Nagoya Japan.
- Miyata, Susanne. 2003. Wakachi2002 v.2.1. Wakachigaki gaidorain [Word and morpheme separation guideline for Japanese]. <http://childes.psy.cmu.edu/morgrams/Wakachi2002> (accessed 5 November 2012).
- Miyata, Susanne. 2012a. Nihongo MLU (heikin hatsuwachō) no gaidorain: Jiritsugo MLU oyobi keitaiso MLU no keisanhō [Guideline for Japanese MLU: How to compute MLUw and MLUm]. *Kenkō Iryō Kagaku* 2, 1–15. <http://aska-r.aasa.ac.jp/dspace/bitstream/10638/5113/1/0039-002-201203-1-17.pdf> (accessed 5 November 2012).

- Miyata, Susanne. 2012b. CHILDES nihongoban: Nihongo-yō CHILDES manyuaru 2012 [Japanese CHILDES: The 2012 CHILDES manual for Japanese]. <http://www2.aasa.ac.jp/people/smiyata/CHILDESmanual/chapter01.html> (accessed 5 November 2012).
- Miyata, Susanne. 2012c. Expressive children and the noun bias hypothesis. *Studies in Language Sciences: Journal of the Japanese Society for Language Sciences* 11, 1–23. Tokyo: Kaitakusha.
- Miyata, Susanne, Makiko Hirakawa, Ruth Kanagy, Yoko Kuriyama, Brian MacWhinney, Masahiko Minami, Kyōko Murakami, Hiro Yuki Nisisawa, Yuriko Oshima-Takane, Kiyoshi Otomo, Tomohiko Shirahata, Sirai Hidetosi, Junko Shirai, Yasuhiro Shirai, Masatoshi Sugiura and Hiroko Terada. 2006. The development of the CHILDES-based Language Developmental Score for Japanese (DSSJ). In Mineharu Nakayama, Masahiko Minami, Hiromi Morikawa, Kei Nakamura and Hidetosi Sirai (eds.), *Studies in Language Sciences* (5), 75–90. Tokyo: Kurosio Publishers.
- Miyata, Susanne, Brian MacWhinney, Kiyoshi Otomo, Hidetosi Sirai, Yuriko Oshima-Takane, Makiko Hirakawa, Yasuhiro Shirai, Masatoshi Sugiura and Keiko Itoh. 2013. Developmental Sentence Scoring for Japanese (DSSJ). *First Language* 33(2), 200–216.
- Miyata, Susanne, Makiko Hirakawa, Keiko Itoh, Brian MacWhinney, Yuriko Oshima-Takane, Kiyoshi Otomo, Yasuhiro Shirai, Hidetosi Sirai and Masatoshi Sugiura. 2009. Constructing a new language measure for Japanese: Developmental Sentence Scoring for Japanese. In Susanne Miyata (ed.), *Development of a developmental index of Japanese and its application to speech developmental disorders*. Report of the Grant-in-Aid for Scientific Research (B)(2006-2008) No. 18330141, 15–66. Nagoya: Aichi Shukutoku University.
- Miyata, Susanne, Kyōko Muraki, Hiromi Morikawa and Brian MacWhinney (eds.). 2004. *Kyō kara tsukaeru hatsuwa dētabēsu : shoshinsha no tame no CHILDES nyūmon* [A speech database you can use straightaway: CHILDES for beginners]. Tokyo: Hituzi Syobo.
- Miyata, Susanne and Norio Naka. 1998. Wakachigaki guideline for Japanese: WAKACHI98 v.1.1. *The Japanese Society for Educational Psychology Forum Report No. FR-98-003*. Tokyo: The Japanese Association of Educational Psychology.
- Miyata, Susanne and Norio Naka. 2010. JMOR05.1: The Japanese morphological analysis program based on CLAN. <http://childes.psy.cmu.edu/morgrams/Japanese> (5 November 2012).
- Miyata, Susanne and Hiro Yuki Nisisawa. 2007. The acquisition of Japanese backchanneling behavior: Observing the emergence of aizuchi in a Japanese boy. *Journal of Pragmatics* 39, 1255–1274.
- Miyata, Susanne, Hiro Yuki Nisisawa and Kiyoshi Otomo. 2005. Hatsuwa sampuru kara hattatsu hyōka dekiru ka? [Is it possible to evaluate development from speech samples?]. *Gekkan Gengo* 2005 (10), 66–74.
- Miyata, Susanne, Yuriko Oshima-Takane and Hiro Yuki Nisisawa. 2004. Noun-bias in early Japanese vocabulary and characteristics in maternal speech. In Masahiko Minami, Harumi Kobayashi, Mineharu Nakayama and Hidetosi Sirai (eds.), *Studies in Language Sciences* (3), 87–101. Tokyo: Kurosio Publishers.
- Miyata, Susanne, Kiyoshi Otomo and Hiro Yuki Nisisawa. 2007. Exploring the Developmental Sentence Score for Japanese (DSSJ): A comparison of DSSJ and MLU on the basis of typically developing and delayed children. *The Japanese Journal of Communication Disorders* 24(2), 79–88.
- Miyata, Susanne, Kenji Sagae and Brian MacWhinney. 2013. The syntax parser GRASP for CHILDES. *Journal of Health and Medical Science* 3, 45–62.
- Miyoshi, Nobuhiro. 1999. Compounds and complex predicates: Japanese evidence for a “global” parameter. In Annabel Greenhill, Heather Littlefield and Cheryl Tano (eds.), *Proceedings of the Annual Boston University Conference on Language Development* 23(2), 453–461.
- Morikawa, Hiromi. 1987. Acquisition of case marking and predicate-argument structures in Japanese: A longitudinal study of language acquisition mechanisms. Lawrence, KS: University of Kansas dissertation.

- Morikawa, Hiromi. 1997. Acquisition of case marking and argument structure in Japanese. Tokyo: Kurosio Publishers.
- Murasugi, Keiko. 2011. Japanese syntax: Implications from language acquisition. In Setsuko Arita, Yuko Goto Butler, Eric Hauser, Kaoru Horie, Reiko Mazuka, Yasuhiro Shirai and Jessika Tsubakita (eds.), *Studies in Language Sciences* (10), 17–39. Tokyo: Kurosio Publishers.
- Murasugi, Keiko, Tomomi Nakatani and Chisato Fuji. 2007. VP-shell analysis for the acquisition of Japanese intransitive verbs, transitive verbs, and causatives. *Linguistics* 43, 615–651.
- Murasugi, Keiko, Tomomi Nakatani and Chisato Fuji. 2011. A trihedral approach to the overgeneration of *no* in the acquisition of Japanese noun phrases. In Ho-Min Sohn, Haruko Minegishi Cook, William O'Grady, Leon A. Serafim and Sang Yee Cheon (eds.), *Japanese Korean Linguistics* 19, 527–541. Stanford, CA: CSLI Publications.
- Murata, Kōji. 1968. *Yōji no gengo hattatsu* [Child language development]. Tokyo: Baifūkan.
- Naka, Norio and Susanne Miyata. 1999. CLAN o mochiita nihongo keitaiso kaiseki puroguramu JMOR [The CLAN-based Japanese morphology analysis program JMOR]. *The Japanese Society for Educational Psychology Forum Report No. FR-99-0001*, The Japanese Association of Educational Psychology.
- Ninio, Anat, Catherine E. Snow, Barbara A. Pan and Pamela R. Rollins. 1994. Classifying communicative acts in children's interactions. *Journal of Communication Disorders* 27(2), 157–187.
- Nishibu, Mayumi. 1998. Nihongo kakujoshi ga no kakutoku ni tsuite: Y-ji no dēta bunseki [About the acquisition of the Japanese case particle *ga*: an analysis of the data from the child Y]. In: Nagoya Daigaku Gengobunka Kenkyūkai (ed.), *Kotoba no Kagaku* 11, 201–224. Nagoya: Nagoya University.
- Nishibu, Mayumi. 2000. Nominative case particle in Japanese first language acquisition: analysis of supply rates in two longitudinal data. In Yuriko Oshima-Takane, Yasuhiro Shirai and Hidetosi Sirai (eds.), *Studies in Language Sciences* (1), 111–122. Toyota: Chukyo University.
- Noji, Junya. 1973–1977. *Yōji gengo no seikatsu no jittai* I–IV. Hiroshima: Bunka Hyōron Shuppan.
- Nomura, Jun. 2007. Japanese postposing as an indicator of emerging discourse pragmatics. In Heather Caunt-Nulton, Samantha Kulatilake and I-hao Woo, *A Supplement to the Proceedings of the 31st Boston University Conference on Language Development*, 1–9. Somerville, MA: Cascadilla Press.
- Nomura, Jun. 2008. CHILDES no kiso [Basic CHILDES]. University of Hawai'i at Mānoa. <http://childes.psy.cmu.edu/intro/nomura/> (accessed 5 November 2012).
- Nomura, Masami and Yasuhiro Shirai. 1997. Overextension of intransitive verbs in the acquisition of Japanese. In Eve Clark (ed.), *Proceedings of the Twenty-Eighth Annual Child Language Research Forum*, 233–242. Stanford, CA: CSLI Publications.
- Ogura, Tamiko. 2006. How the use of “non-adult words” varies as a function of context and children's linguistic development. In Mineharu Nakayama, Masahiko Minami, Hiromi Morikawa, Kei Nakamura and Hidetosi Sirai (eds.), *Studies in Language Sciences* (5), 103–120. Tokyo: Kurosio Publishers.
- Ogura, Tamiko, Philip S. Dale, Yoshie Yamashita, Toshiki Murase and Aki Mahieu. 2006. The use of nouns and verbs by Japanese children and their caregivers in book-reading and toy-play contexts. *Journal of Child Language* 33, 1–29.
- Ogura, Tamiko, Norio Naka, Yoshie Yamashita, Toshiki Murase and Aki Mahieu. 1997. Nihongo kakutokujī to bunpō no hattatsu: CLAN puroguramu ni yoru bunseki [Lexical and grammatical development in the Japanese children: Analysis through the CLAN program]. *Bulletin of the Faculty of Human Development (Kobe University)* 4(2), 31–57.
- Ogura, Tamiko, Yoshie Yamashita and Mihoko Tsubota. 1997. Baby talk and children's linguistic and cognitive development. *Bulletin of the Faculty of Human Development (Kobe University)* 5(1), 1–14.

- Oshima-Takane, Yuriko and Brian MacWhinney (eds.). 1995. *CHILDES manual for Japanese*. Montreal: McGill University.
- Oshima-Takane, Yuriko, Brian MacWhinney, Hidetosi Sirai, Susanne Miyata and Norio Naka (eds.). 1998. *CHILDES Manual for Japanese 2nd edn*. The JCHAT Project, Nagoya: Chukyo University.
- Oshima-Takane, Yuriko, Susanne Miyata and Norio Naka. 2000. Acquisition of grammatical categories: role of physical objects and input. In Yuriko Oshima-Takane, Yasuhiro Shirai and Hidetosi Sirai (eds.), *Studies in Language Sciences* (1), 97–109. Nagoya: Chukyo University.
- Ota, Mitsuhiro. 1998. Minimality Constraints and the prosodic structure of child Japanese. In David J. Silva (ed.), *Japanese Korean Linguistics* 8, 331–344. Stanford, CA: CSLI Publications.
- Ota, Mitsuhiro. 1999. Phonological theory and the development of prosodic structure: Evidence from child Japanese. Washington, DC: Georgetown University dissertation.
- Ota, Mitsuhiro. 2001. Phonological theory and the development of prosodic structure: Evidence from child Japanese. *Annual Review of Language Acquisition* 1, 65–118.
- Ota, Mitsuhiro. 2003. *The development of prosodic structure in early words: Continuity, divergence and change*. Amsterdam: John Benjamin.
- Ota, Mitsuhiro. 2006. Input frequency and word truncation in child Japanese: Structural and lexical effects. *Language and Speech* 49, 261–295.
- Ota, Mitsuhiro. 2013. Lexical frequency effects on phonological development: The case of word production in Japanese. In Marilyn Vihman and Tamar Keren-Portnoy (eds.), *The emergence of phonology: Whole word approaches, Cross-linguistic evidence*, 415–438. Cambridge, UK: Cambridge University Press.
- Ozeki, Hiromi. 2005. Daiichi, daini gengo ni okeru nihongo meishi shūzoku shūtoku katei: ruikeiron-teki apurōchi [The acquisition process of nominal attributes in Japanese L1 and L2: a language-typological approach]. Doctoral thesis, Tokyo: Ochanomizu Women's University.
- Ozeki, Hiromi. 2008. *Daiichi, daini gengo ni okeru nihongo meishi shūshokusetsu shūtoku katei* [Acquisition process of the Japanese attributive clause in first and second language acquisition]. Tokyo: Kurosio Publishers.
- Ozeki, Hiromi and Yasuhiro Shirai. 2005. Semantic bias in the acquisition of relative clauses in Japanese. In Alejna Brugos, Manuella R. Clark-Cotton and Seungwan Ha (eds.), *Proceedings of the 29th Annual Boston University Conference on Language Development*, Volume 2, 459–470. Somerville, MA: Cascadilla Press.
- Ozeki, Hiromi and Yasuhiro Shirai. 2007a. The consequences of variation in the acquisition of relative clauses: An analysis of longitudinal production data from five Japanese children. In Yoshiko Matsumoto, David Y. Oshima, Orrin W. Robinson and Peter Sells (eds.), *Diversity in Language: Perspectives and Implications*, 243–270. Stanford, CA: CSLI Publications.
- Ozeki, Hiromi and Yasuhiro Shirai. 2007b. The acquisition of Japanese noun-modifying clauses: A comparison with Korean. In Naomi McGloin and Junko Mori (eds.), *Japanese Korean Linguistics* 15, 263–274. Stanford, CA: CSLI Publications.
- Ozeki, Hiromi and Yasuhiro Shirai. 2010. Semantic bias in the acquisition of relative clauses in Japanese. *Journal of Child Language* 37(1), 197–215.
- Prince, Alan and Paul Smolensky. 2004. *Optimality Theory: Constraint interaction in generative grammar*. Malden, MA: Blackwell.
- Sagae, Kenji, Eric Davis, Alon Lavie, Brian MacWhinney and Shuly Wintner. 2010. Morphosyntactic annotation of CHILDES transcripts. *Journal of Child Language* 37, 705–729.
- Sagae, Kenji, Avon Lavie and Brian MacWhinney. 2005. Automatic measurement of syntactic development in child language. *ACL '05 Proceedings of the 43rd Annual Meeting of the Association for Computational Linguistics*, 197–204. <http://childes.psy.cmu.edu/grasp/acl05-IPSyn.pdf> (accessed 5 November 2012).

- Sarnecka, Barbara. W., Valentina G. Kamenskaya, Yuko Yamana, Tamiko Ogura and Yulia. B. Yudovina. 2007. From grammatical number to exact numbers: Early meanings of “One,” “Two,” and “Three” in English, Russian, and Japanese. *Cognitive Psychology* 55, 136–168.
- Scarborough, Hollis S. 1990. Index of productive syntax. *Applied Psycholinguistics* 11, 1–22.
- Shirai, Yasuhiro. 1994. Discourse motivations for some cognitive acquisition principles. *Studies in Second Language Acquisition* 16, 133–156.
- Shirai, Yasuhiro. 1995. Tense-aspect marking by L2 learners of Japanese. In Dawn MacLaughlin and Susan McEwen (eds.), *Proceedings of the 19th Annual Boston University Conference on Language Development*, Vol. 2, 575–586. Somerville, MA: Cascadia Press.
- Shirai, Yasuhiro. 1998. The emergence of tense-aspect morphology in Japanese: Universal predisposition? *First Language* 18, 281–309.
- Shirai, Yasuhiro and Ping Li. 2000. *The acquisition of lexical and grammatical aspect*. *Studies on Language Acquisition* 16. Berlin: Mouton de Gruyter.
- Shirai, Yasuhiro and Susanne Miyata. 2006. Does past tense marking indicate the acquisition of the concept of temporal displacement in children’s cognitive development? *First Language* 26, 45–66.
- Shirai, Yasuhiro, Susanne Miyata, Norio Naka and Yoshiko Sakazaki. 2000. The acquisition of causative morphology: Why does it correlate with the imperative? In Eve V. Clark (ed.), *Thirtieth Child Language Research Forum Proceedings*, 87–94. Stanford, CA: CSLI Publications.
- Shirai, Yasuhiro, Susanne Miyata, Norio Naka and Yoshiko Sakazaki. 2001. The acquisition of causative morphology in Japanese: A prototype account. In Mineharu Nakayama (ed.), *Issues in East Asian language acquisition*, 183–203. Tokyo: Kurosio Publishers.
- Shirai, Yasuhiro and Yoko Suzuki. 2012. The acquisition of the Japanese imperfective aspect marker: Universal predisposition or input frequency? In Peter Sells and Bjarke Frellesvig (eds.), *Japanese Korean Linguistics* 20, 281–293. Stanford, CA: CSLI Publications.
- Sugisaki, Kōji. 2005. Early acquisition of basic word order: New evidence from Japanese. In: Alejna Brugos, Manuella R. Clark-Cotton and Seungwan Ha, *Proceedings of the Annual Boston University Conference on Language Development* 29, 2, 582–591.
- Sugisaki, Kōji. 2008. Early acquisition of basic word order in Japanese. *Language Acquisition* 15, 183–191.
- Sugisaki, Kōji. 2010. A note on the structure of relative clauses in child Japanese. In: Hiroki Maezawa and Azusa Yokogoshi (eds.), *The Proceedings of the Sixth Workshop on Altaic Formal Linguistics. MIT Working Papers in Linguistics* 61, 1–9. Cambridge, MA: MIT Press.
- Sugisaki, Kōji. 2011. The distinction between case markers and postpositions in early child Japanese: New evidence for children’s grammatical conservatism. In: Nick Danis, Kate Mesh, and Hyunsuk Sung (eds.), *Boston University Conference on Language Development Proceedings Supplement* 35, 1–8. http://www.bu.edu/bucld/proceedings/supplement/vol35/35-Sugisaki_BUCLD35.pdf (accessed 6 November 2012).
- Suzuki, Yoko. 2009. Otona to kodomo no danwa ni okeru “nenne (suru)” kōbun to “nainai (suru)” kōbun no keishiki to imi: verbal noun (suru) kōbun no shūtoku kenkyū ni mukete [The form and meaning of the *nenne (suru)* construction and the *nainai (suru)* construction in adult-child conversations: Towards a developmental research of the verbal noun (suru) construction]. Tokyo: Tokyo University master thesis.
- Suzuki, Yoko. 2013. Intarakushon no naka de tsukawareru onomatope dōshi: oyako danwa no bunseki kara [Onomatopoeic verbs used in interactions: from the analysis of mother-child conversations]. In: Kazuko Shinohara (ed.), *Onomatope kenkyū no shatei: chikazuku oto to imi*. [The range of onomatopoeia research: Approaching sound and meaning], 167–181. Tokyo: Hituzi Syobo.

- Tanaka, Nozomi. 2011. L1 Acquisition of Japanese verb argument structure: How do children acquire grammar in the absence of clear evidence? Pittsburgh: University of Pittsburgh master thesis.
- Tanaka, Nozomi and Yasuhiro Shirai. In press. L1 acquisition of Japanese transitive verbs: How do children acquire grammar in the absence of clear evidence? In: Seungho Nam, Heejeong Ko and Jongho Jun (eds.), *Japanese Korean Linguistics* 21. Stanford, CA: CSLI Publications.
- Tsuji, Hiromi and Rhona Stainthorp. 2008. An investigation of maternal communication styles during conversations with young children: drawing an analysis of the expression of communicative intentions in Japanese dyads. In: Tamiko Ogura, Harumi Kobayashi, Shunji Inagaki, Makiko Hirakawa, Setsuko Arita and Yasushi Terao (eds.), *Studies in Language Sciences* (7), 95–111. Tokyo: Kurosio Publishers.
- Ushijima, Yoshitomo and Kaname Moriwaki. 1943. Yōji no bunshō no kōzō [Sentence structure in child language]. Aiiku Kenkyujo (ed.), Yōji no gengo hattatsu [Child language acquisition], 55–79. Tokyo: Meguro Shoten. <http://dl.ndl.go.jp/info:ndljp/pid/1069706> (accessed 5 December 2012)
- Watamaki, Toru. 1981. Shoki bumpō kakutokuki no hattatsu no sūryōteki tokusei [Quantitative characteristics of the early grammar acquisition stage]. *Proceedings of the 45th Conference of the Japanese Psychological Association*, 506.
- Watamaki, Toru. 1993. Nihongo MLU keisan no tame no hatsuwa bunkatsu gaido dai 2 han. [Guideline for the segmentation of Japanese utterances for the computation of MLU, 2nd edition]. Nagoya: Nagoya Hattatsu Shōgai Kenkyūjo.
- Yamamoto, Taeko, Tomoko Matsui and Peter McCagg. 2005. Use of the connective “datte” and development of theory of mind. In: Masahiko Minami, Harumi Kobayashi, Mineharu Nakayama and Hidetosi Sirai (eds.), *Studies in Language Sciences* (4), 83–98. Tokyo: Kurosio Publishers.
- Yamashita, Yoshie. 1999. The acquisition of nouns and verbs. In: Annabel Greenhill, Heather Littlefield and Cheryl Tano (eds.), *Proceedings of the Annual Boston University Conference on Language Development* 23(2), 741–752.

11 KY corpus

1 Introduction

The KY corpus, named after the two main researchers who developed the corpus: Osamu Kamada and Hiroyuki Yamauchi, is a learner corpus in Japanese developed in the Japan Society for the Promotion of Science (JSPS) project *Comprehensive Research on the Acquisition of Japanese as a Second Language* (led by Hiroko Quackenbush from 1996 to 1998). Because the KY corpus is a collection of interviews based on the ACTFL Oral Proficiency Interview (OPI), it is a relatively natural spoken corpus. The KY corpus is also balanced with respect to the learners' native languages and levels. This corpus consists of 30 Chinese-speaking learners, 30 Korean-speaking learners, and 30 English-speaking learners with 5 novice, 10 intermediate, 10 advanced, and 5 superior learners for each language. Although the corpus is smaller than recent (written) text corpora, it is one of the pioneer learner corpora that is well balanced and well structured. The format and the data structure of the KY corpus have been followed by many later developed learner corpora.

The KY corpus has four characteristics from the perspective of data users. First, the learners' abilities are categorized based on the ACTFL Proficiency Guidelines for speaking, and hence it is a useful resource for studies on learners with different levels. While learning histories or Japanese Language Proficiency Tests (JLPT) are used to determine learners' levels of proficiency in most cases, they do not necessarily represent the learners' communication ability. The ACTFL Proficiency Guidelines for speaking are more objective and reliable to determine learners' communication ability (Surface and Dierdorff 2003). Second, since the data format is standardized, the corpus is machine-friendly and easy to search for the purpose of quantitative as well as qualitative studies. Third, the contents of the interviews are unified, making it easier to compare them. The interviews consist of four parts: warm-up, level checks, probes, and wind-down, with the exception of the novice learners: there is no probes part for novice learners. Fourth, it is easy to identify a unit of utterance because the interview consists of questions mainly by a trained interviewer and answers mainly by a learner. For these reasons, the KY corpus is one of the most useful corpora in the field of Japanese as a second language (JSL) and has been used in many studies.

This chapter focuses on the KY corpus as an example of learner corpus. In section 1, we overview the characteristics of the corpus in a larger context. In section 2, we discuss the basic information of the corpus as a text corpus, such as its structure and size. In section 3, we introduce the two versions of the KY corpus: the original and the annotated KY corpus. We discuss how to search through the corpus. In section 4, we discuss the KY corpus as a resource for studies on second language

acquisition and introduce various kinds of studies using the corpus; more specifically, we show how the KY corpus is used in studies such as error analysis, interlanguage analysis, acquisition process, and textbook and language test development. In section 5, we overview a case study of the corpus to show further possibilities of the KY corpus application. In section 6, we briefly introduce other related language resources. Finally, in section 7, we discuss possibilities of further issues associated with learner corpora.

2 KY corpus: Overview

In this section, we discuss the nature of the data in the KY corpus. In 2.1, we discuss the learners' background such as their native languages and levels. In 2.2, we overview the naming system of the corpus. Finally, in 2.3, we discuss the transcription format of the corpus.

2.1 Learners' background

The native languages of the learners who participated in the corpus are Chinese¹, Korean, and English, which are the three main native languages of L2 learners of Japanese. Table 1 shows the top 10 countries or regions where Japanese is learned. As shown in this table, in 7 out of 10 countries (i.e., South Korea, China, Australia, U.S.A., Taiwan, New Zealand, and Canada), either Chinese, Korean, or English is predominantly spoken. The KY corpus covers representative native languages of JSL learners.

Table 1: Top 10 Countries or Regions Where Japanese is Learned (as of 2003)²

	Country or region	# of learners
1	South Korea	894,131
2	China	387,924
3	Australia	381,954
4	U.S.A.	140,200
5	Taiwan	128,641
6	Indonesia	85,221
7	Thailand	54,884
8	New Zealand	28,317
9	Canada	20,457
10	Brazil	19,744

¹ Chinese might include a variety of Chinese languages such as Mandarin, Cantonese, and Shang-hainese.

² <http://www.jpfl.go.jp/j/japanese/survey/result/dl/2003gaiyou.pdf>

The levels of the learners are also well balanced. There are four levels in the ACTFL Proficiency Guidelines (Breiner-Sanders et al., 2000): *novice*, *intermediate*, *advanced*, and *superior*, as in Table 2. Each level is standardized based on the ACTFL Proficiency Guidelines. To understand more on OPI and its applications to pedagogy, see also Kamada et al. (2008; 2009) and Kamada and Shimada (2012).

Table 2: The ACTFL Proficiency Guidelines – Speaking

Novice
<ul style="list-style-type: none"> • respond to simple questions on the most common features of daily life • convey minimal meaning to interlocutors experienced with dealing with foreigners by using isolated words, lists of words, memorized phrases and some personalized recombinations of words and phrases • satisfy a very limited number of immediate needs
Intermediate
<ul style="list-style-type: none"> • participate in simple, direct conversations on generally predictable topics related to daily activities and personal environment • create with the language and communicate personal meaning to sympathetic interlocutors by combining language elements in discrete sentences and strings of sentences • obtain and give information by asking and answering questions • sustain and bring to a close a number of basic, uncomplicated communicative exchanges, often in a reactive mode • satisfy simple personal needs and social demands to survive in the target language culture
Advanced
<ul style="list-style-type: none"> • participate actively in conversations in most informal and some formal settings on topics of personal and public interest • narrate and describe in major time frames with good control of aspect deal effectively with unanticipated complications through a variety of communicative devices • sustain communication by using, with suitable accuracy and confidence, connected discourse of paragraph length and substance • satisfy the demands of work and/or school situations
Superior
<ul style="list-style-type: none"> • participate fully and effectively in conversations in formal and informal settings on topics related to practical needs and areas of professional and/or scholarly interests • provide a structured argument to explain and defend opinions and develop effective hypotheses within extended discourse • discuss topics concretely and abstractly • deal with a linguistically unfamiliar situation • maintain a high degree of linguistic accuracy • satisfy the linguistic demands of professional and/or scholarly life

(Breiner-Sanders et al., 2000: p. 18)

The KY corpus consists of 12 subgroups (4 levels * 3 native languages of learners), each of which consists of 5 or 10 interviews. The number of interviews of each level and language is shown in Table 3.

Table 3: Native Languages and Levels of Learners

	Novice	Intermediate	Advanced	Superior	Sum
Chinese	5	10	10	5	30
Korean	5	10	10	5	30
English	5	10	10	5	30
Sum	15	30	30	15	90

In addition to the four levels in Table 3, the learners at each level are also categorized into sub-levels (high, mid, and low). A detailed distribution of learners is shown in Table 4 in the next section.

2.2 File naming system

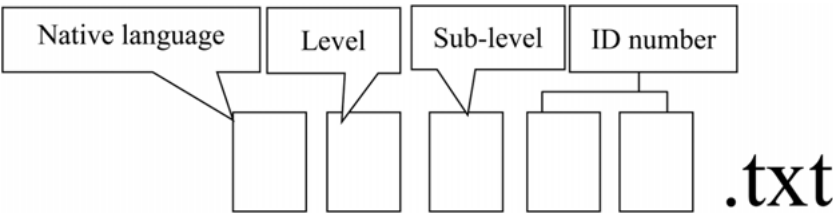


Figure 1: File naming system of KY corpus

The transcription files of the KY corpus are named systematically as shown in Figure 1. The first letter indicates the learner’s native language; *C* stands for Chinese, *K* for Korean, and *E* for English. The second indicates his/her level; *N* stands for novice, *I* for intermediate, *A* for advanced, and *S* for superior. The third indicates his/her sub-level; *L* stands for low, *M* for mid, and *H* for high. The fourth and the fifth are numbers unique to each file. All possible combinations are summarized in Table 4.

There are no sub-levels for superior learners. Note that the number of interviews in each sub-level varies across learners’ native languages and the corpus is not perfectly balanced in terms of learners’ sub-levels.

Table 4: File Naming Possibilities

	Native language	Level	Sub-level	# of interviews
(1)	C(hinese)	N(ovice)	L(ow)	1
			M(id)	2
			H(igh)	2
(2)		I(ntermediate)	L	3
			M	4
			H	3
(3)		A(dvanced)	–	3
(4)			H	7
		S(uperior)	–	5
(5)	K(orean)	N	L	2
			M	1
			H	2
(6)		I	L	2
			M	6
			H	2
(7)		A	–	6
(8)			H	4
		S	–	5
(9)	E(nglish)	N	L	1
			M	2
			H	2
(10)		I	L	4
			M	4
			H	2
(11)		A	–	37
(12)			H	
		S	–	5

2.3 Transcription format

As discussed above, the KY corpus is a collection of transcriptions of 90 ACTFL OPIs. Each interview consists of an interaction between a learner and a licensed interviewer. The corpus is a set of text files, whose format is shown in *Figure 2*. Note that all characters except for *T*, *S*, and parenthesis are double-byte characters.

T	Interviewer (Tester)'s utterance.
S	Learner (Subject)'s utterance.
,	Pause. More commas indicate a longer pause.
—	Lengthened vowel. More dashes indicate longer lengthening
< >	Backchannel response. It is inserted into an appropriate part of utterances without a line break.
{ }	Non-linguistic actions.
*	Inaudible part. One asterisk roughly corresponds to one syllable.
()	Unclear parts.
[]	Square brackets indicate that there were proper names, which is replaced with the brackets with brief explanation of the referent such as [NAME] and [UNIVERSITY]. To disambiguate multiple referents, numbers are added as in [UNIVERSITY1] and [UNIVERSITY2] if necessary.

Figure 2: Transcription rules of KY corpus

All lines start with *T* or *S*. All those that start with *T* indicate that they are interviewers' utterances, whereas those with *S* indicate that they are uttered by learners. Pauses and vowel lengthening are indicated by commas and dashes, respectively. Angle brackets indicate that the utterance therein is a backchannel response such as *soodesuka* 'oh I see' and *hai* 'yeah' or 'uh-huh', which are directly embedded in the transcription. Curly brackets (e.g., {LAUGH}) indicate non-linguistic elements such as laughing. Inaudible or unclear parts are also transcribed using asterisks and parentheses respectively. Finally, utterances related to learners' private information are replaced with square brackets with brief description.

3 Practical introduction to KY corpus

In this section, we discuss how to use the corpus: how to acquire it and how to search through the corpus. We also introduce software products for this purpose. In 3.1, we discuss the original KY corpus and, in 3.2, we overview the annotated KY corpus.

3.1 KY corpus as a text corpus

Those who desire to acquire the KY corpus should contact Hiroyuki Yamauchi, one of the developers of the KY corpus, via e-mail.³

As discussed in the last section, the corpus is a set of text files and is searchable by applications for text search. Examples of text search software are summarized in Table 5.

Table 5: Text Search Software

Name of product	License agreement	Searchable format
KWIC Finder ⁴	Shareware	.txt, .doc, .xls, etc.
WideGrep Express ⁵	Shareware	.txt, .doc, .xls, .pdf, etc.
JGrepper ⁶	Free license	.txt, .doc, .xls, .pdf, etc.

Basically, text files can be searched by any kind of software listed above in the following way: specify (a) file(s) or folder(s) to be searched and enter keywords, and the software shows the query result. However, different software products show slightly different results with the same keywords and the result formats are also different. Although these software products are not developed for the purpose of corpus studies and are not suitable for large texts, they are enough for small corpora like the KY corpus. For details on text search, see Lee et al. (2012).

3.2 KY corpus as annotated corpus

In addition to raw transcription files, an annotated version of the KY corpus (the *annotated KY corpus web version*) is also available online⁷. It was developed in the JSPS project *corpus-Based Approach to Cognitive Syntax and its Application to Educational Grammar of Japanese* (led by the first author of this chapter from 2007 to 2008). Word boundaries and part-of-speech information are annotated by human annotators, and hence more advanced search became possible. Moreover, learners' errors are also annotated, which makes error analysis easier with larger data.

³ See the website of the KY corpus for detailed information including Yamauchi's e-mail address. http://www.opi.jp/shiryo/ky_corp.html

⁴ The free version can search text files. Windows 95 or higher and Internet Explorer 4.0 or higher are required. See: http://www31.ocn.ne.jp/~h_ishida/KWIC.html

⁵ Windows 95 or higher is required. <http://homepage2.nifty.com/AnoSoft/>

⁶ Windows 2000 or higher is required. Microsoft Word 2003 and Microsoft PowerPoint 2003 or lower are required. <http://www.vector.co.jp/soft/winnt/util/se482234.html>

⁷ <http://jhlee.sakura.ne.jp/kyc/>

As will be discussed in section 4, many studies investigate a particular grammatical categories or lexical items and use learners' errors. These kinds of information have already been annotated in the corpus, which makes it easy for individual researchers to study quantitatively as well as qualitatively. In addition, semantic categories have also been annotated, which opens further possibility of JSL acquisition studies. See Lee and Isahara (2009) as an example of studies of this kind. This study will be discussed also in 4.2.

Figure 3: Search window of the annotated KY corpus

A searching system was also developed for corpus search.⁸ The system does not require any kind of special programming skill. Figure 3 is a search window of the annotated KY corpus. It can search for (i) keywords by morpheme or sequence, (ii) parts of speech, and (iii) semantic categories. Parts of speech and semantic categories can be chosen from pull-down menus. It is also possible to add the following search options through checkbox options:

- (i) Correct and error usage,
- (ii) Learners' levels: novice, intermediate, advanced, and superior, and
- (iii) Learners' native languages: Chinese, Korean and English.

These search options make the corpus search effective and precise for the purpose of research. The searching result can be downloaded in Microsoft Excel format or text (tab-separated) format for further quantitative and/or qualitative analysis. See Lee (2009) for the detailed information of the development of the annotated KY corpus and Lee et al. (2012) for how to use the annotated KY corpus.⁹

⁸ Windows and Microsoft Excel are required.

⁹ Although Lee et al. (2012) only has an instruction on how to use E-KWIC, an offline searching tool for the annotated KY corpus, the searching procedure of the online version is very similar to, or simpler than, the offline version and the information therein is still useful. See also an online instruction: <http://jhlee.sakura.ne.jp/kyc/howto/>.

4 Studies using KY corpus

In this section we overview studies using the KY corpus to show that a wide range of investigations is possible with the KY corpus. Since there are many studies and the space is limited, we can introduce only some of them. In 4.1, we briefly overview studies on issues of the KY corpus development. In 4.2, we discuss a variety of studies on L2 acquisition based on the KY corpus, and in 4.3, studies on textbook and test development. See also Kamada (2006) for a review of studies using the KY corpus and Quackenbush et al. (1999), one of the earliest study collections using the KY corpus.

4.1 Building KY corpus

There are studies on methodologies of building the KY corpus. Kamada (1999) summarizes the background of why the KY corpus was built and why natural spoken data are important, the characteristics of the KY corpus (and OPI), and possibilities and limitations of research using the KY corpus. Yamauchi (1999) focuses more on technical aspects of the corpus and OPI: levels and the procedure of OPI, the procedure of building the corpus, the data format and structure, and the nature of the data. The contents of these papers are summarized in Section 2.

4.2 L2 acquisition process and interlanguage development

This section overviews studies on acquisition of Japanese as L2 and interlanguage development using the KY corpus to show possibilities of L2 acquisition studies using learner corpora. See also Quackenbush et al. (1999) and Noda et al. (2001), which are collections of varieties of studies employing learners' production data including the KY corpus. Quackenbush et al. (1999) is a collection of studies by researchers who developed the KY corpus and thus one of the earliest studies using the KY corpus. The areas they studied vary widely: phonetics, phonology, writing system, grammar, discourse, theme writing, sociolinguistics, and loan words, as well as the methodology of building the KY corpus. Many of the papers included in this collection are referred to as individual studies in this chapter.

Noda et al. (2001) is a collection of studies that attempted to construct learners' interlanguages by showing the way they process sentences and how the native language influence their interlanguages. Noda et al. also compare children's language acquisition and adults' acquisition. Kamada (2006) suggests that their studies helped them to develop the method of JSL teaching for communication (Noda, 2005). Many of the papers included in Noda et al. (2001) are also referred to as individual studies in this chapter.

The table in each section summarizes studies on L2 acquisition using the KY-corpus based on topics. As shown in each table, a wide variety of studies are possible with the KY corpus both quantitatively and qualitatively. In the following sections we overview some of the studies listed in the table.

4.2.1 Sound acquisition

Since the sound data of the KY corpus are not available, studies on sound acquisition are limited to the researchers who developed the KY corpus. Among a few studies of this kind, we discuss Kawano (1999) and Toda and Quackenbush (1999), which is summarized in Table 6.

Table 6: Studies on Sound Acquisition

Topics	Studies
Acquisition process and interlanguage development of verb pitch accent	Kawano (1999)
Acquisition of pitch accent of loan words	Toda and Quackenbush (1999)

Kawano (1999) analyzed Chinese learners' acquisition of two kinds of verb inflections in Japanese: verb inflections that the word-specific accents do not matter and those that they do matter. He found that the pitch accents of the former type were produced correctly regardless of the learners' levels, while those of the latter type were produced more correctly as the learners' levels become higher. He also suggested that there are systematic errors of both verb inflection types and speculated that the learners employ some kind of strategy in producing these errors.

Toda and Quackenbush (1999) analyzed learners' pitch accents of non-Chinese loan words. Word accent types are categorized based on where the accent nucleus is: type 0 for a word without accent nucleus, type -2 with a word with the nucleus at the second-to-last mora, type -3 for a word with the nucleus at the third-to-last mora, and so on. They found that: (i) the acquisition of type -2 precedes the acquisition of type -3, and that of type -3 precedes the acquisition of type 0; (ii) the interlanguage seems to be influenced by type -2 because type -2 tends to be overgeneralized; (iii) while it has been pointed out that type -3 is the default accent type in loan words for Japanese native speakers, the acquisition of type -3 is not overgeneralized and the accuracy of type -3 is lower than that of type -2. They also investigated native speakers' evaluations of loan word accents produced by L2 learners and found that (iv) the number of morae is more important than the accurate accent.

4.2.2 Grammar acquisition

Compared to studies on phonetics, there are many studies on grammar acquisition using the KY corpus. Here we only introduce some studies that take advantage of the KY corpus. Table 7 summarizes some of the studies on grammar acquisition.

Table 7: Studies on Grammar Acquisition

Topics	Studies
Acquisition process of tense and aspect expressions	Sheu (2000), Cui (2011)
Acquisition of case particles	Sakoda (1999), Matsuda (2001), Lee and Isahara (2006)
Acquisition of conditionals	Neancharoensuk (2001)
Fragment sentences	Piao (2010)
Acquisition of noun-modifying constructions	Ozeki and Shirai (2007), Ozeki (2008)
Acquisition of viewpoint expression	Tanaka (2001)

Sheu (2000) and Cui (2011) are studies on acquisition of tense and aspect expressions such as *teiru* ‘PROG’ and *ta* ‘PAST’. Here we discuss mainly Cui (2011) who analyzed correct and incorrect aspectual expressions of Chinese, Korean, and English speaking learners from the corpus. She categorized each example produced by learners based on the SRE Theory proposed in Reichenbach (1947). She found the order of learning aspectual expressions shared across learners of different native languages. Reichenbach’s SRE theory employs speech time (S), reference time (R), and event time (E) to describe tense and aspect. In (1), for example, the event of marriage (E) precedes (represented by “<”) S and R, which is represented as the notation “E < S, R” (the comma means that S and R are simultaneous).

- (1) *Sorede anoo motiron kekkon-mo site-masu-ne.*
 And FL of.course marriage-also do.PROG-POL-SFP
 ‘So, of course you are married, right?’ (E < S, R) (CIH03, Cui, 2011: p. 7)

Cui coded the order of S, R, and E to all tense or aspect expressions in the KY corpus and found the following general learning process of Japanese tense and aspect.

- (i) S and E are not distinguished.
- (ii) S and E start to be distinguished. Also R starts to be recognized only when R is simultaneous with S and E.
- (iii) R is recognized only when R is simultaneous with either S or E.
- (iv) R is independently recognized.

She also found subtle different learning orders between Chinese/Korean speaking learners and English speaking learners; the former learners are not good at recogniz-

ing R simultaneous with E, while the latter learners are good at recognizing not only R simultaneous with E but also independent R, which is simultaneous with neither S nor E. She suggests that this might be because of the influence from their native languages.

Lee and Isahara (2006) classified the usage of the case particle *ni* (dative and locative) by Korean learners in the KY corpus using cluster analysis and investigated the formation of interlanguage. They especially focused on the subjects, semantic categories of the predicates and words collocating with *ni*, and word order in sentences that include *ni*. They found that: (i) novice, intermediate, and advanced learners use similar portions of *ni* as locative marker (e.g., *daigaku-ni hairu* ‘university-*ni* enter’); (ii) as the level becomes higher, benefactive *ni* (e.g., *sensei-ni ageru* ‘teacher-*ni* give’) is used more frequently, and theme or goal *ni* (e.g., *ziten-sya-ni noru* ‘bicycle-*ni* ride’) is used less frequently; and (iii) each cluster is formed by complex interactions among factors rather than by a single factor. They also make suggestions in terms of the theory of interlanguage formation. First, the learning progress of some expression does not necessarily correlate with the increase of usage of the expression. For example, they found that the relative frequency of theme or goal *ni* decreases as the level becomes higher. Second, language acquisition cannot be captured in a black-and-white way, i.e., by whether a learner uses some expression or not. For example, it is not the case that novice learners do not use some expressions at all and more advanced learners start to use them.

Neancharoensuk (2001) investigated the acquisition process of conditionals. She classified conditionals produced by learners in the KY corpus and analyzed them in terms of the learners’ levels and native languages. She found that the prototypical conditionals tend to be used earlier than non-prototypical conditionals. The prototypical conditionals consist of general statement (i.e., if A is the case, then always B is the case), non-past habit (i.e., if A is the case, usually B is the case), hypothesis, plan, and confirmed fact.¹⁰ The non-prototypical conditionals, on the other hand, consist of counter-factual and past habit. She attributes the late acquisition of non-prototypical conditionals to extra processing cost: counter-factual requires the speaker to process the real situation in addition to hypothetical situations, and past

¹⁰ Confirmed facts are not conditional in a normal sense, although the conditional marker *tara* ‘if/when’ is used. A typical example is as in (1).

(1) *Soto it-tara tiisai kizu-ga ari-masi-ta*
 Outside go-when small scratch-NOM exist-POL-PAST
 ‘When (I) went outside, there was a small scratch (on the car).’

(Neancharoensuk, 2001: p. 31)

As shown in (2), the same marker *tara* can be used as conditional marker.

(2) *Yooroppa-toka-ni it-tara motto at-ta-kamo sire-nai-n-desu-keredomo*
 Europe-etc.to go-when more exist-PAST-might know-NEG-NMLZ-COP.POL-though
 ‘I might have got culture shock if I have been to Europe.’ (KS06)

habit to process the current situation in addition to the past situations. The learning process was similar across learners of different native languages.

Piao (2010) is a study on acquisition of fragment sentences. Fragment sentences mainly discussed in this paper are subordinate clauses that do not have main clauses, but function as independent utterance. For example, the following example (2) ends with the subordinate clause marker *kedo* ‘though’ but functions as a complete utterance.

- (2) *Nn itioo gotisoo si-te itadaki-tai-n-desu-kedo*
 FL FL treat do-and receive-want-NMLZ-COP.POL-though
 ‘Well, though I want (them) to treat me.’ (CAH07)

According to this paper, approximately 16 % of native Japanese speakers’ utterances are fragment sentences. They are used to show the speaker’s politeness or discourse structure and it is necessary for L2 learners to learn and use them appropriately. She analyzed fragment sentences in the annotated KY corpus in terms of learners’ levels and native languages. Her findings are as follows. First, as the level becomes higher, learners use more fragment sentences as well as non-fragment sentences (canonical use). The average frequency of them is also becoming closer to those of native speakers in higher levels. Intermediate learners frequently use *te* ‘and’, *kara* ‘because’, and *kedo* ‘though’, among which *te* ‘and’ is used most frequently. In the advanced level, the frequency of *te* ‘and’ decreases, while that of *kedo* ‘though’ increases. Interestingly, superior learners are reported to overuse *kedo* ‘though’. Second, she suggests from the frequency of each subordinate clause markers that *te* ‘and’ and *kara* ‘because’ are acquired first at the intermediate level, *kedo* ‘though’ acquired at the advanced level, and *node* ‘since’ at the superior level. Also, learners at higher levels use *kedo* ‘though’ and *node* ‘since’ more frequently, while *te* ‘and’ and *kara* ‘because’ are used less frequently. Third, regardless of the learners’ native languages, superior learners tend to overuse *kedo* ‘though’, and use *kara* ‘because’ less frequently and *node* ‘since’ more frequently. Korean learners tend to use more fragment sentences than learners with other native languages.

Ozeki and Shirai (2007) and Ozeki (2008) analyze acquisition process of noun-modifying constructions using the KY corpus and a sentence-combining experiment. Their research question was whether the acquisition process of noun-modifying clauses follows the noun phrase accessibility hierarchy (NPAH) or not. The NPAH is a hierarchy of head NPs that can be relativized across languages, which is summarized in (3). NPAH predicts that if a language relativizes some grammatical category, it can also relativize categories higher on the scale. For example, if a language can relativize Indirect Objects, it can also relativize Subjects and Direct Objects because they are higher on the scale than Indirect Objects.

- (3) *Subject > Direct Object > Indirect Object > Oblique*

They did not find any pattern across different data. Learners (and also Japanese children) can relativize Direct and Indirect Objects as early as Subjects. They suggest that this is because Japanese lacks different morphological markers for relativizing different grammatical categories. Subject relative clauses are superficially the same as other kinds of relative clauses. Interestingly, they found that, except for Korean learners, learners at intermediate or lower levels tend to associate Subject head NPs with animate entities, and all kinds of learners tend to associate Direct Object and Oblique head NPs with inanimate entities. Their sentence-combining experiment supported that learners use different types of relative clauses based on the animacy of the head noun. Ozeki (2008) further investigated the acquisition of noun-modifying constructions and found that learners at lower proficiency levels tend to avoid center-embedding and use noun-modifying construction at the beginning of sentences. She concludes that center-embedding, rather than the grammatical roles in the main clause, affects the learners' usage of noun-modifying construction. She also found that, while learners that have learned Japanese naturally in everyday life tend to use modifying clauses that express attribute or state, learners that have learned Japanese in the classroom and those who were interviewed in the KY corpus do not follow this tendency. Whereas she recognizes the continuity of the acquisition of adjective modification and clause modification in L2 acquisition (as well as in L1 acquisition), she also speculates that classroom teaching makes it easier for learners to use clause modification at earlier stages.

4.2.3 Morphology acquisition

One can also find many acquisition studies on morphology, some of which are summarized in Table 8.

Table 8: Studies on Morphology Acquisition

Topics	Studies
Acquisition of paired transitive and intransitive verbs	Yao (2004), Ito (2012)
Error analysis of adjective inflection	Kinoshita (2007)
Acquisition of compound verbs	Chen (2010)

Yao (2004) analyzed errors of transitive and intransitive verbs produced by Chinese learners and compared spoken data (the KY corpus) with written data (collected by the author). Yao categorized the learners' errors into the following types: (i) ability forms (*rareru*) instead of intransitive verbs, (ii) passive forms instead of intransitive verbs, (iii) causative forms instead of intransitive verbs, (iv) confusing

transitive and intransitive forms, (v) inappropriate choice of transitive and intransitive verbs, (vi) direct translation from the native languages, and (vii) wrong case particles. She found that there are more errors of the type (iv) in the spoken data than the written data, while those of the type (vi) are found more frequently in the written data. Yao attributes the latter to the fact that the learners had more time to think in their native languages, while she speculates that the former is caused by the time constraints.

Kinoshita (2007) analyzed errors of two kinds of adjectives in Japanese: *i*-adjective (*kawaii* ‘cute’) and *na*-adjective (*suki-na* ‘favorite’) of prenominal and predicative forms. He found that prenominal form of *na*-adjectives are used least frequently and produced incorrectly at the highest rate of all adjective forms. On the other hand, the predicative form of *i*-adjectives are used most frequently and produced correctly at the highest rate. This is the case especially with Chinese speaking learners and English speaking learners. For those learners, there are negative correlations between the frequency of use and the error rate. Many of the *na*-adjectives in the corpus were difficult lexical items, while most of the *i*-adjectives were easy. The author speculated that this difficulty affects the learner’s ability to produce adjectives correctly.

Chen (2010) investigated quantitatively the acquisition of two kinds of compound verbs: syntactic compound verbs (productive compounds such as *tabe-owaru* ‘finish eating’) and lexical compound verbs (unproductive compounds such as *tori-kumu* ‘work on (lit. take-braid)’) (Kageyama 1993). Chen used the KY corpus for spoken data and *Contrastive Linguistic Database for Japanese Language Learners’ Written Language* developed in National Institute for Japanese Language and Linguistics (NINJAL) for written data. According to Chen’s findings, syntactic compound verbs are more difficult to acquire than lexical compound verbs for intermediate and advanced learners in the KY corpus. Superior learners use correct syntactic compound verbs as well as lexical compound verbs. Chen suspects that lexical compound verbs are easier because they are conventionalized and learners can simply memorize the whole compounds and do not have to create new compound verbs unlike syntactic compounds. He asked 15 native speakers to correct the learners’ errors and used ChaSen (a morphological analyzer developed by Matsumoto Lab in NAIST)¹¹ to divide the texts.

4.2.4 Lexicon acquisition

It is also important to measure the size of learners’ vocabulary and measure the correlation between the vocabulary size and the learners’ levels. However, it is well

¹¹ ChaSen is available at: <http://chasen-legacy.sourceforge.jp/>

known that it is difficult to do so. Yamauchi (2004) argued that the size of vocabulary varies widely depending on individuals and topics in corpora and it is difficult to determine the vocabulary size across learners within the same level. For example, he showed that the vocabulary size becomes bigger as the data becomes bigger and the vocabulary size did not converge. We still do not know how big the data needs to be to measure the learners' vocabulary. Hashimoto (2010) proposed a method to measure the size of learners' vocabulary using the KY corpus as well as other OPI data. To measure the whole vocabulary of learners at some level, large corpora are required. He proposed to specify a topic to limit a vocabulary of one particular area. As is well known, typical OPIs consist of tasks such as describing the town, how to cook something, the story of a movie, and the rules of sports. At least in some topics such as sports and cooking, 10 interviews in the KY corpus appear to be enough; the type frequency of sports vocabulary converges to approximately 100, and that of cooking to approximately 90. On the other hand, he also admits that his method applies only in some limited areas. For example, different movies contain totally different vocabularies. In this kind of area, it is still difficult to measure the learners' vocabulary.

4.2.5 Acquisition of communication strategies

Since the KY corpus is a collection of interviews of OPI, it is possible to observe the interactions between the learner and the interviewer: how they behave in a polite way, how they expand topics, and so on. Therefore, one can also study the acquisition of communication strategies. Some studies on the acquisition of communication strategies are summarized in Table 9.

Table 9: Studies on Communication Strategies Acquisition

Topics	Studies
Preface expressions	Chen and Furue (2007), Sakakibara (2008)
Wh-questions	Kobayashi (1999)
Self-qualification	Geyer (2007)

Chen and Furue (2007) investigate quantitatively and qualitatively prefaced expressions (e.g., *sumimasen-ga* 'excuse me'). They categorized prefaced expressions into four types: apology (e.g., *excuse me*), humble (e.g., *though I'm not an expert of this*), summary (e.g., *from my point of view*), and comment insertion (e.g., *though this is a personal thing...*). They found that humble, summary, and comment insertion are used more as the level becomes higher, while apology tends not to be used across all levels. They suggest that this is because, whereas humble, summary, and

comment insertion require the learners to think about themselves or the content of what they are going to say, apology expressions require concern for hearers. The latter expressions are more difficult to acquire than the former three. They argue that it is important to teach learners concern for hearers.

Kobayashi (1999) focused on *wh*-questions of learners and argues that the learners' questions differ qualitatively as their levels become higher. She identified three types *wh*-questions in the KY corpus: meta question (e.g., *what does the expression X mean?*), clarification question, and smoothing question, i.e., a question which is not necessary for understanding the conversation, but makes the communication smooth (e.g., *how old do I look?*). According to her findings, only learners at higher levels use smoothing questions. Smoothing questions are not necessary in the sense that you can communicate without them. Kobayashi proposed that smoothing questions can be used mainly by more advanced learners because they can process extra communicative tasks such as smoothing communication in addition to constructing sentences and using particles correctly, while novice and intermediate learners mainly concentrate on constructing sentences. She also found that Chinese speaking learners use smoothing questions less often than English and Korean speaking learners, but does not provide explanation for this.

Finally, Geyer (2007) discuss the acquisition of self-qualification strategies in terms of pragmatic and discourse competences as well as grammatical competency. She investigated self-qualification, or qualifying segment of talk that reduces the force of the speaker's own utterances. Self-qualification is frequently introduced in Japanese with contrastive markers such as *kedo/ga* 'although' as in (4a) and *demo* 'but' as in (4b), both of which are assumed to be followed by the utterance (4c). (4a) and (4b) introduced by *kedo/ga* or *demo* qualify the epistemic modality of the subsequent main argument, by stating the speaker's lack of relevant knowledge in this example.

- (4) a. *Anmari yoku siri-mase-n-ga* (.)
 Not.really well know-POL-NEG-although
 'Although I don't know well,'
 b. *Anmari yoku siri-mase-n* (.) ***demo***
 Not.really well know-POL-NEG but
 'I don't know well, but'
 c. *nihon-eiga sukina hito ooi-n-zyanai-desu-ka*
 Japan-movie live person many-NMLZ-NEG-POL-Q
 'there are many people who like Japanese movies, aren't there?'

(Geyer, 2007: p. 340)

She found, through examining the interviews of English speaking learners in the KY corpus, that learners with lower proficiency already have pragmatic categories such as self-qualification, but they lack a grammatical repertoire to express them.

She also showed that while learners have linguistic knowledge of various contrastive expressions such as *kedo* and *demo*, their knowledge does not necessarily result in effective qualification. Both results support arguments of the previous literature. Moreover, she found that successful self-qualification is achieved not only by the placement of appropriate connective expressions but also through effective use of foregrounding and/or backgrounding discourse mechanisms. She argues that the results indicate a close relationship between pragmatic, grammatical, and discourse competence in learner language.

4.3 Textbook and test development

The KY corpus has also been used for textbook development. For instance, Yamauchi (2000) and Ogiwara et al. (2005), which became important educational resources, integrate the idea of OPI into the classroom. Kamada et al. (2012) is a textbook made by OPI researchers for learners to develop their reading skills with actual everyday examples. Yamauchi (2000) is a task-oriented textbook; each chapter has a specific situations and tasks such as complaining about wrong orders in a restaurant. This textbook is particularly useful as a collection of materials for role-playing.

There are studies on OPI and pedagogy. Yamauchi (2005) focuses on one of the classic problems of L2 acquisition, namely fossilization, and proposes specific procedures of fossilization and syllabus using OPI to prevent fossilization. He also discusses level judgments in OPI based on his KY corpus development experience. Yamauchi (2009) discusses communication skills, especially proficiency, in the context of L2 acquisition of Japanese and pedagogy to develop such skills from various points of view. Shimada (2008) shows various kinds of specific examples of role-playing in terms of OPI, which is also an important part of the KY corpus. She also proposes to use OPI in classroom activities.

4.4 Summary

This section discussed various examples of studies using the KY corpus. As shown in this section, the KY corpus can be used in a wide range of areas applying a variety of methods. There are many studies that use errors produced by learners and their alternative expressions corrected by native speakers. There are also many studies on specific morphemes such as *teiru* ('PROG') and *wh*-phrases. Some studies [e.g., Chen (2010) discussed in 4.2] even employed morphological analyzers recently developed in the field of natural language processing. This requires investigators to spend much time to annotate sometimes using sophisticated techniques of programming. As discussed in 3.2, however, the annotated KY corpus is now available, which enables all researchers to investigate learners' errors and their alternative correct expressions and to search the KY corpus by grammatical and semantic categories of expressions as well as by specific morphemes without spending much time struggling with computers.

Figure 4 shows that learners of different levels have different characteristics in terms of the numbers of sentences and morphemes. Novice learners produce fewer morphemes than learners of the other levels. While they produce as many sentences as superior learners, most of the novice learners produce fewer than 1000 morphemes. This indicates that the sentences of novice learners are short and simple. This is shown more clearly in *Figure 5*, which plots the levels of learners against the average numbers of morphemes per sentence.

There are two main characteristics of intermediate learners. First, in contrast to novice learners, intermediate learners produce more sentences and morphemes, which represents the well-known talkative characteristics of intermediate learners. Second, the numbers of sentences and morphemes produced by intermediate learners vary more widely depending on individuals than novice learners.

Advanced learners can be divided into two groups: those who produce long sentences that are small in number and those who produce many short sentences. These two categories seem to correspond to advanced learners closer to the superior level and those closer to the intermediate level, respectively; the first group mostly consists of advanced-high learners, while the second group seems to consist of advanced learners at other sub-levels. For example, KAH04 (Korean speaking advanced-high learner) and EAH06 (English speaking advanced-high learner) belong to the first group; KAH04 consists of 4,246 morphemes and 71 sentences, and EAH06 4,727 morphemes and 68 sentences. They seem closer to the superior level. On the other hand, for example, CA01 (Chinese speaking advanced learner) and EA03 (advanced English speaking learner) belong to the second group; CA01 contains 2,255 morphemes and 153 sentences, and EA03 1,889 morphemes and 105 sentences. They seem closer to the intermediate level.

Finally, superior learners produce many morphemes but the numbers of sentences are smaller than those produced by intermediate and advanced learners, which indicates that superior learners produce longer sentences. For example, KS06 (Korean speaking superior learner) contains 5,075 morphemes and 49 utterances, which means there are approximately 100 morphemes in a single sentence on average. Similarly, CS01 (Chinese speaking superior learner) contains 3,323 morphemes and 45 utterances, which means there are more than 70 morphemes in a single sentence on average. This observation shows one of the main characteristics of superior learners; they talk about a single topic in detail in long sentences.

Figure 5 plots the average numbers of morphemes per sentence based on the levels of learners. The figure clearly shows that the number of morphemes per sentence increases as the level becomes higher. Novice learners produce 10 morphemes per sentence, intermediate learners 23 morphemes, advanced learners 39 morphemes, and superior learners 56 morphemes.

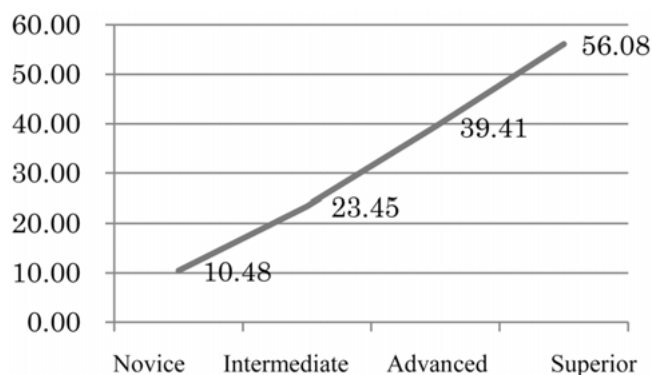


Figure 5: Average # of morphemes per sentence vs. levels

5.2 Errors

Another feature of the annotated KY corpus is that it has error and correction information. This feature enables us to summarize and analyze the learners' errors easily. Multiple native speakers of Japanese identified and corrected errors morpheme by morpheme. Errors are divided into three types: (a) use of incorrect morphemes, (b) insertion of extra morphemes, and (c) lack of necessary morphemes. Also, errors are categorized based on the part of speech as below. See Lee (2009) for further detail.

- (i) Noun error: choice of incorrect nouns
- (ii) Verb error: choice of incorrect verbs or incorrect inflection
- (iii) Adjective error: choice of incorrect adjectives or incorrect inflection
- (iv) Auxiliary error: choice of incorrect auxiliary or incorrect inflection
- (v) Particle error: choice of incorrect particles
- (vi) Adverb error: choice of incorrect adverbs
- (vii) Adnominal error: choice of incorrect adnominals

In this section we analyze the number of errors of each level.

Figure 6 is a scatter plot of the number of errors vs. the number of morphemes each learner produced. One can find relatively dense groups of novice and superior groups, while intermediate and advanced learners scatter widely. Although both novice and superior learners make fewer mistakes than other learners, the reasons of this are different: while novice learners talk less and hence fewer mistakes, superior learners talk more but make fewer mistakes than learners at the other levels.

While in *Figure 4* the distributions of advanced and superior learners almost overlap with each other and the difference is not clear, in *Figure 6*, one can see the difference more clearly. The figure shows the relationships between the numbers of morphemes the learners produced in an interview and the number of errors. Since

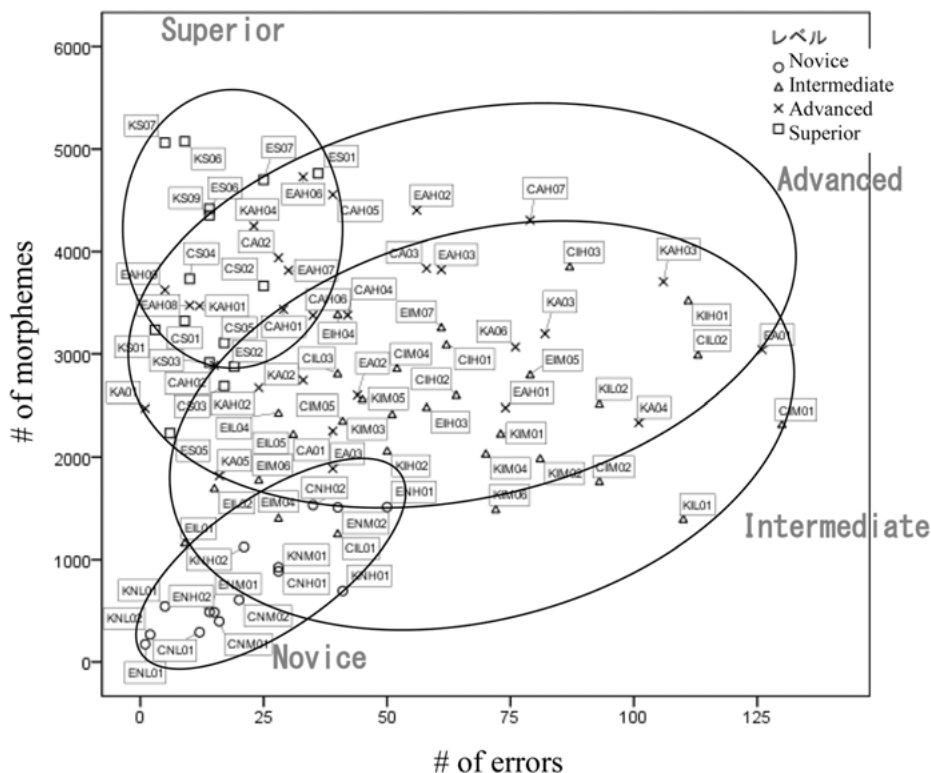


Figure 6: # of morphemes vs. errors

errors are identified morpheme by morpheme, the plot can be interpreted as the ratio of errors each learner produced. In terms of the number of morphemes and sentences, learners such as KAH03 (Korean speaking advanced-high learner) and CAH07 (Chinese speaking advanced-high learner) are very similar to superior learners. In terms of the number of errors, on the other hand, they are clearly different. Both KAH03 and CAH07 made more errors than average superior learners; KAH03 made 106 errors and CAH07 made 79 errors.

The average number of errors at each level is shown in Figure 7. A novice learner made 21.9 errors on average, an intermediate learner made 61.7 errors, an advanced learner made 50.6 errors, and a superior learner made 14.9 errors. If the graph in Figure 7 is plotted in terms of correct morphemes, the curve is U-shaped; novice learners produce correct expressions at higher ratio than intermediate learners, who produce the largest ratio of errors, and the ratio of correct production becomes higher again as the level becomes higher. The U-shaped learning curve is typically observed in physical or cognitive skill development and has been reported to be observed in L2 acquisition (see Ellis 2008 for summary).

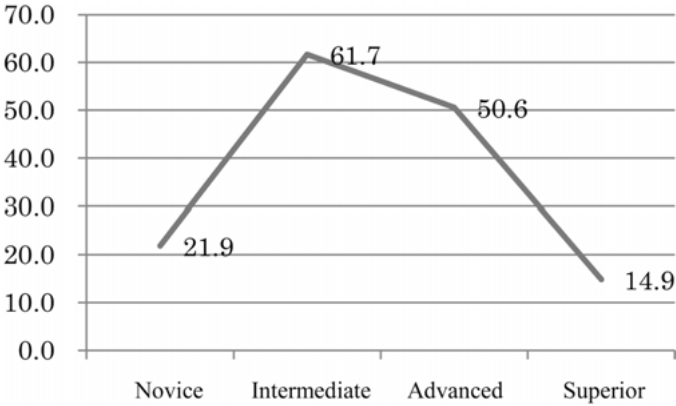


Figure 7: Average # of errors vs. levels of learners

Figure 8 shows the average number of errors at different levels depending on learners' native languages. It is well known that errors are influenced by learners' native languages. Figure 8 tells us two things in terms of learners' native languages. First, among Chinese and Korean speakers, intermediate learners make the most errors and errors decrease as the level becomes higher, while, among English speakers, advanced learners make the most errors. Second, intermediate English speaking learners make half as many errors as intermediate Chinese and Korean speaking learners. There are a variety of potential reasons for this. English speakers might have learned Japanese in environments and methodology totally different from those of Chinese and Korean speakers. Chinese and Korean speakers might speak more

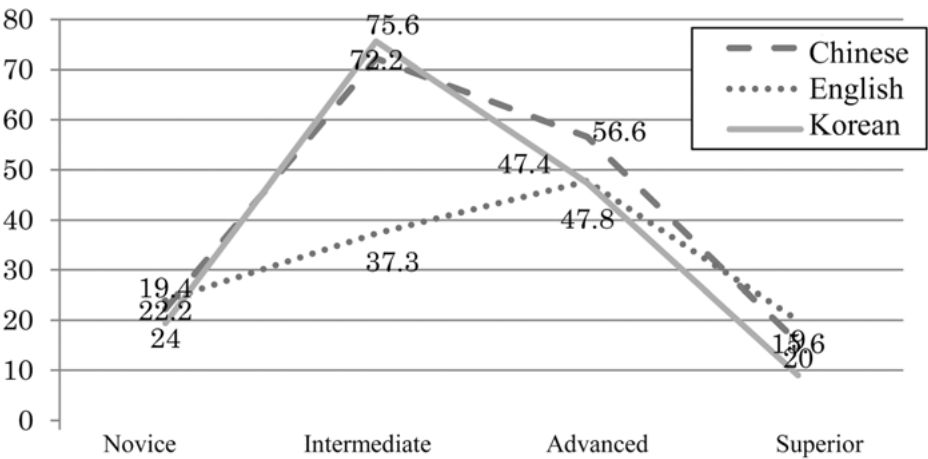


Figure 8: # of errors and levels in learners of different native languages

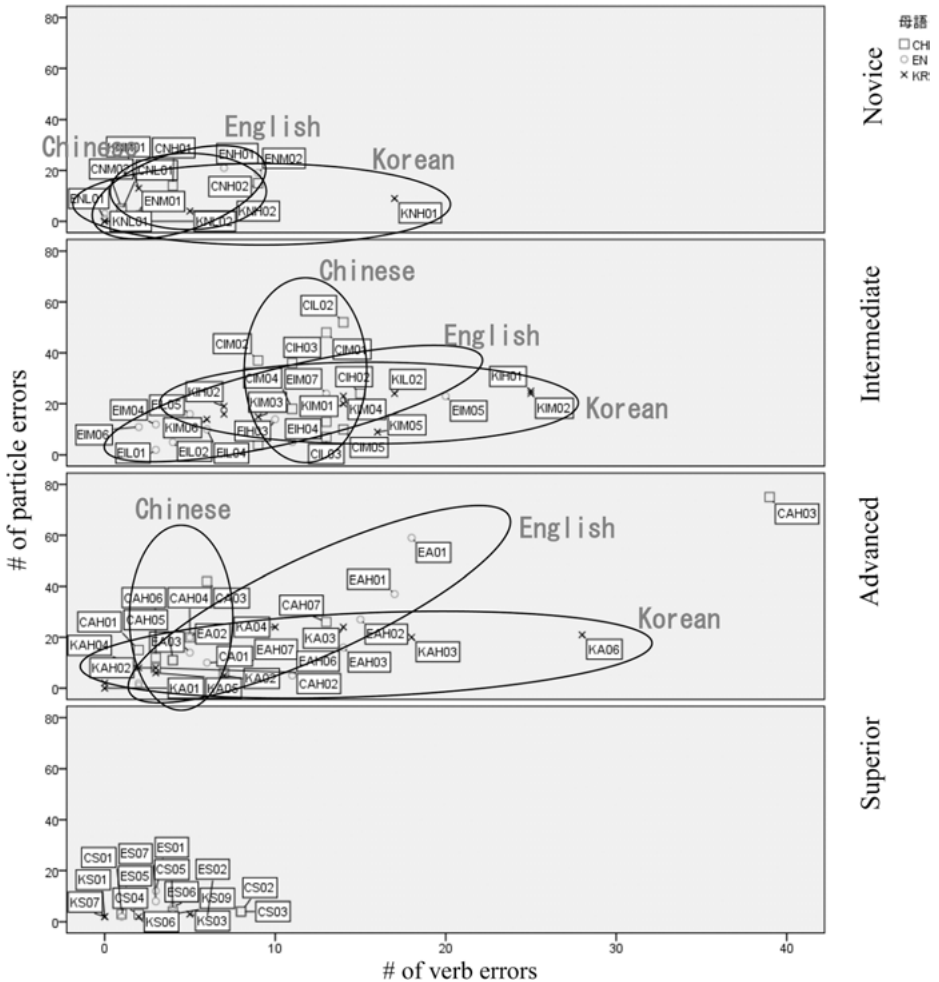


Figure 9: # of errors of verbs vs. particles based on learners' levels

than English speakers and tend to be categorized into higher levels at earlier stages. Further investigation is necessary to determine what causes the difference.

To take a closer look at the difference of errors between native languages, we analyzed two major grammatical errors of learners, i.e., errors of particles and verbs. We also analyzed one of the most major lexical errors, i.e., nouns. *Figure 9* shows scatter plots of the numbers of errors of particles against those of verbs based on learners' levels. First, Korean speaking learners at all levels scatter horizontally, which means that the numbers of verb errors vary depending on learners at all levels. However, they make fewer particle errors at all levels, which may be because Korean also has particles of similar kinds. Second, intermediate Chinese speaking learners scatter vertically, which indicates that the numbers of particle errors vary

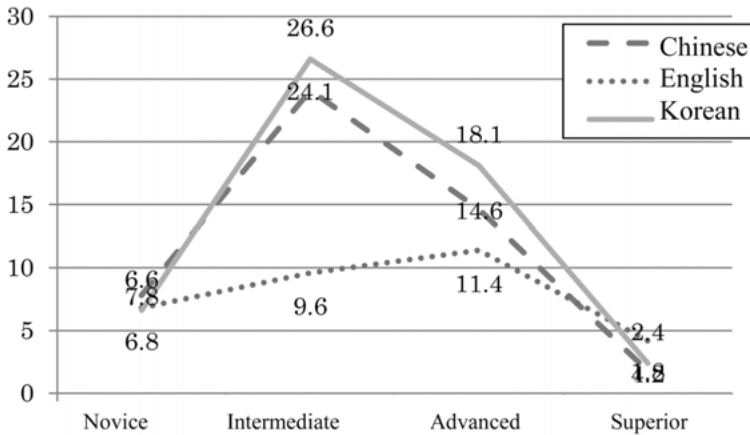


Figure 10: Average # of noun errors vs. learners' levels based on native languages

depending on learners. Third, verb errors and particle errors made by English speaking learners especially at the intermediate and advanced levels correlate with each other, which means that learner who make more verb errors make more particle errors. Finally, all superior learners make fewer verb and particle errors.

We also analyzed the relationships between the number of noun errors, learners' levels, and their native languages, which are shown in *Figure 10*. The figure indicates the average numbers of noun errors vs. learners' levels based on their native languages. As shown in the figure, among Chinese and Korean speakers, intermediate learners make the most errors out of all levels, while, among English speakers, advanced learners make the most errors. This follows the overall tendency as discussed in relation to *Figure 8*.

Although Korean learners make fewer particle errors than other learners as shown in *Figure 9*, they make more noun errors as well as verb errors than other learners. Both Korean and Japanese employ particles to express grammatical relations, which might make it easy for Korean learners to acquire particles. Moreover, one cannot observe a simple pattern for the number of verb errors by Korean learners. These facts indicate that noun errors are more important factor than other types of errors to measure the accuracy of utterances produced by Korean learners.

For Chinese learners, particles are more important factor than other types of errors because the particle errors vary depending on Chinese learners' levels as discussed in relation to *Figure 9*. For English speaking learners, one cannot decide simply from *Figure 8*, *Figure 9*, and *Figure 10* what factors are important for their levels. It seems that other factors that have not discussed are indicator of the learners' levels. Candidates of other factors are fluency and the ability to develop a topic in detail and to build a logical structure of a story, which are also important factors in OPI. These factors cannot be quantitatively studied even in the annotated KY corpus, and it is necessary to investigate qualitatively.

6 Related language resources

As mentioned above, the KY corpus is one of the influential learner corpora using OPI. Therefore, it has been referred to by many researchers who have built learner corpora. Among the many learner corpora, here we discuss *Database of Japanese Language Learners' Conversation* (DJSJL)¹² developed at NINJAL. DJSJL is a collection of interviews between learners and interviewers (testers), each of which consists of 30-minute conversation. Of 339 transcriptions of interviews that are available online,

The screenshot shows the DJSJL search interface. At the top, there's a search bar with the text "日本語学習会話データ". Below it, there's a section titled "検索" (Search) with a brief explanation in Japanese. The main part of the interface is a search form with several dropdown menus and checkboxes. The form is organized into two main sections: "OPIレベル" (OPI Level) and "検索条件" (Search Conditions). The "OPIレベル" section includes dropdowns for "OPIレベル" (with options like 初級-下, 初級-中, 初級-上, 中級-下), "性別" (Gender), "年齢" (Age), "出身国" (Country of Origin), and "母語" (Mother Language). The "検索条件" section includes dropdowns for "職業" (Occupation), "日本語学習期間" (Japanese Learning Period), "日本語能力試験" (Japanese Language Proficiency Test), and "検索" (Search) and "検索条件クリア" (Clear Search Conditions) buttons. Below the search form, there's a table with 17 rows of search results. Each row contains the following information: データ番号 (Data Number), OPIレベル (OPI Level), 年齢 (Age), 性別 (Gender), 出身国 (Country of Origin), 母語 (Mother Language), 職業 (Occupation), 日本語学習期間 (Japanese Learning Period), 日本語能力試験 (Japanese Language Proficiency Test), TXT (Text), and MP3 (MP3).

データ番号	OPIレベル	年齢	性別	出身国	母語	職業	日本語学習期間	日本語能力試験	TXT	MP3
1	上級-中	33	男	韓国	韓国語	日本語学生	10ヶ月	10ヶ月	表示	DL
2	中級-下	22	女	韓国	韓国語	大学生	3ヶ月	11ヶ月	表示	DL
3	上級-下	37	女	韓国	韓国語	日本語学生	1年	10ヶ月	表示	DL
4	中級-上	24	女	韓国	韓国語	日本語学生	6ヶ月	1年6ヶ月	表示	DL
5	中級-上	30	女	韓国	韓国語	専門学校生	0年	23ヶ月	表示	DL
6	中級-中	24	女	韓国	韓国語	日本語学生	3ヶ月	7ヶ月	表示	DL
7	中級-中	25	女	韓国	韓国語	日本語学生	2ヶ月	8ヶ月	表示	DL
8	初級	28	女	韓国	韓国語	会社員	6年	7年	表示	DL
9	中級-上	26	女	韓国	韓国語	日本語学生	6ヶ月	9ヶ月	表示	DL
10	中級-下	25	男	韓国	韓国語	日本語学生	5ヶ月	5ヶ月	表示	DL
11	上級-中	23	男	韓国	韓国語	日本語学生	2ヶ月	3年	表示	DL
12	初級	26	男	韓国	韓国語	専門学校生	2年	10年	表示	DL
13	上級-下	22	女	韓国	韓国語	日本語学生	14ヶ月	40ヶ月	表示	DL

Figure 11: Search window of DJSJL

¹² <https://dbms.ninjal.ac.jp/nknet/ndata/opi/> (only in Japanese)

225 files are available with sound data files. Like the KY corpus, DJSL employs OPI and follows the transcription format of the KY corpus. Therefore, it is easy to compare DJSL with the KY corpus. Registration is required to use the corpus. The corpus is searchable online and only web browsers are required to search through the corpus. It is possible to search by characteristics of learners including their level of language proficiency, age, sex, nationality, native language, and occupation, as well as the duration of their stay in Japan. *Figure 10* is a search window of DJSL. DJSL is more effective than the KY corpus in that it is searchable by a variety of learners' information. The search result can be downloaded for further analysis. However, there are no applications available for searching or analyzing downloaded results.

Also, two large learner corpora are (planned to be) released (as of September 2015): *Corpus of Japanese as a Second Language* (C-JAS) and *International Corpus of Japanese as a Second Language* (I-JAS). Unfortunately, the limitation of space does not allow us to outline the corpora. See the website for more information.¹³

7 Conclusion

In this chapter, we discussed the KY corpus and studies using the KY corpus. First, we overviewed the background of the development of the KY corpus. Second, we discussed the design of the KY corpus. Third, we introduced how to search through transcriptions of the corpus and the annotated version of the KY corpus. Fourth, we overviewed studies using the KY corpus including studies on learners' acquisition process, interlanguage development, pedagogy, and textbook development. Fifth, we discussed case studies to show further possibilities of studies using the KY corpus. Finally, we overviewed language resources associated with the KY corpus.

We expect more language resources like the KY corpus will be released in the future, especially learner corpora of writings following ACTFL Proficiency Guidelines of writing, as pointed out in Yui (2009). If such learner corpora of writings are developed, it will be intriguing to compare them with those of speaking, which would enable us to capture the communication abilities of learners more broadly.

References

- Breiner-Sanders, Karen E., Pardee Lowe Jr., John Miles and Elvira Swender. 2000. ACTFL proficiency guidelines – Speaking (Revised 1999). *Foreign Language Annals* 33(1). 13–18. [Available at: <http://www.actfl.org/files/public/Guidelines.pdf>]
- Chen, Xi. 2010. Dai-ni gengo-to shite-no ni-shurui-no fukugō-dōshi-no shūtoku: kōpasu-ni yoru gakushūsha-no shiyō-jittai-chōsa-o moto-ni [Acquisition of two kinds of compound verbs in

¹³ <http://ninjal-sakoda.sakura.ne.jp/lsaj/> (only in Japanese)

- [JSL: a corpus study] *Studia Linguistica* 23. 19–35. [Available at: <http://www.lang.nagoya-u.ac.jp/nichigen/0-kyouiku/research/kotoba/23/1002.pdf>]
- Chen, Zhen-Yu and Naomi Furue. 2007. Chūgokugo-o bogo-to-suru Nihongo gakushūsha-ni-yoru maeoki hyōgen no shūtoku: KY kōpasu-o riyō shite [Acquisition of prefaced expressions by Chinese learners of Japanese: A study conducted using the KY corpus]. *Gengo Bunka Kenkyū. Gengo Jōhō-hen [Journal of Language and Culture. Language and Information]* 3. 211–224.
- Cui, Ya-Zhen. 2011. Shizen hatsuwa-ni-okeru Nihongo tensu, asupekuto-no shūtoku kenkyū: R ji-no ninshiki-o chūshin-ni [Acquisition of Japanese tense and aspect in natural utterance: focusing on the recognition of the reference time]. *Japanese Language Teaching Association in Honor of Professor Fumiko Koide* 19. 5–19.
- Ellis, Rod. 2008. *The study of second language acquisition*. 2nd edn. Oxford: Oxford University Press.
- Geyer, Naomi. 2007. Self-qualification in L2 Japanese: An interface of pragmatic, grammatical, and discourse competences. *Language Learning* 57 (3). 337–367.
- Hashimoto, Naoyuki. 2010. OPI-dēta-ni miru wadai-to goi-no kankē: OPI-dēta-o mochiita goi-kenkyū. *Nihongo OPI Kenkyūkai 20-Shūnen Kinen Rombunshū/Hōkokusho*: 112–120.
- Ito, Hideaki. 2012. Gakushū-sha-wa tsui-no aru ji-ta-dōshi-o donoyō-ni tsukatte-iru-ka: chūgoku-jin Nihongo gakushū-sha-no chūkyū-kara chōkyū-ni chūmoku shite [How learners use paired intransitive-transitive verbs with special attention to intermediate or higher Chinese L2 learners of Japanese]. *Kokusai Nihon Kenkyū [Journal of International and Advanced Japanese Studies]* 4. 43–52.
- Kageyama, Taro. 1993. *Bumpō-to go-kēsē* [Grammar and word formation]. Tokyo: Hituzi Syobo.
- Kamada, Osamu. 1999. KY kōpasu-to dai-ni gengo-to-shite-no Nihongo-no shūtoku kenkyū [The KY corpus and the acquisition of Japanese as an L2]. In Hiroko Quackenbush (ed.), *Dai-ni gengo-to-shite-no Nihongo-no shūtoku-ni kansuru sōgō kenkyū* [Comprehensive research on the acquisition of Japanese as a second language], 227–237. JSPS research project report.
- Kamada, Osamu. 2006. KY kōpasu-to Nihongo kyōiku [KY corpus and JSL]. *Nihongo Kyōiku [Journal of Japanese Language Teaching]* 130. 42–51.
- Kamada, Osamu and Kazuko Shimada. 2012. *Taiwa-to purofishiensihi: Komyunikēshon-nōryoku-no hirogari-to takamari-o mezashi-te (Purofishiensihi-o sodateru 2)* [Proficiency and conversation: towards deeper and higher communicative abilities (Developing proficiency for true Japanese language ability 2)]. Tokyo: Bonjinsha.
- Kamada, Osamu, Kazuko Shimada and Kumiko Sakoda (eds.). 2008. *Purofishiensihi-o sodateru: Shin-no Nihongo nōryoku-o mezashite* [Developing proficiency for true Japanese language ability]. Tokyo: Bonjinsha.
- Kamada, Osamu, Hiroyuki Yamauchi and Ryoichi Tsutsumi (eds.). 2009. *Purofishiensihi-to Nihongo kyōiku* [Proficiency in teaching Japanese as a second language]. Tokyo: Hituzi Syobo.
- Kamada, Osamu, Fusako Beuckmann, Yoshiko Tomiyama and Machiko Yamamoto. 2012. *Ikita kyōzai-de manabu shin chūkyū-kara jōkyū-e-no Nihongo* [Authentic Japanese: Progressing from Intermediate to advanced]. Tokyo: Japan Times.
- Kawano. 1999. Dōshi-no akusento-no shūtoku [Acquisition of verb accent]. In Hiroko Quackenbush (ed.), *Dai-ni gengo-to-shite-no Nihongo-no shūtoku-ni kansuru sōgō kenkyū* [Comprehensive research on the acquisition of Japanese as a second language], 297–311. JSPS research project report.
- Kinoshita, Noriaki. 2007. KY kōpasu-ni mirareru kēyōsi-no shiyō jōkyō: hyōshutsu-ritsu, goyō-ritsu, nan'i-do-ni chūmoku shite [The use of adjectives in KY corpus: focusing on expression rate, misuse rate, and degree of difficulty]. *Mekai Japanese Language Journal* 12. 61–69.
- Kobayashi, Mina. 1999. KY Kōpasu-ni araware-ta gimonshi gimon-bun: intabyū pāto-ni-okeru gakushū-sha-kara-no shitsumon-ni chūmoku shite [*Wh*-questions in the KY corpus: with special reference

- to questions by learners in interview part]. In Hiroko Quackenbush (ed.), *Dai-ni gengo-to-shite-no Nihongo-no shūtoku-ni kansuru sōgō kenkyū* [Comprehensive research on the acquisition of Japanese as a second language], 379–388. JSPS research project report.
- Lee, Jae-Ho. 2009. Tagu tsuki Nihongo gakushū-sha kōpasu-no kaihatu [Development of annotated learner corpus of Japanese]. *Kēryō Kokugo-gaku* [Mathematical Linguistics] 27 (2). 60–72.
- Lee, Jae-Ho and Hitoshi Isahara. 2006. Dai-ni gengo shūtoku-ni-okeru joshi *ni*-no shūtoku katē-no tēryō-teki bunseki [Quantitative analysis on acquisition process of *ni* in JSL]. *Kēryō Kokugo-gaku* [Mathematical Linguistics] 25 (4). 163–180.
- Lee, Jae-Ho, Shin'ichiro Ishikawa and Yuriko Sunakawa. 2012. *Nihongo kyōiku-no-tame-no kōpasu chōsa nyūmon* [Introduction to corpus studies for JSL]. Tokyo: Kurosio.
- Matsuda, Kenjiro. 2001. Chūkan gengo-to gengo hen'i: KY kōpasu-o tsukatta *o*-kaku zero māku-ka-no bunseki [Interlanguage and variation: zero-marking of *o* in KY corpus]. *Theoretical and Applied Linguistics at Kobe Shoin* 4. 57–76.
- Neancharoensuk, Suneerat. 2001. OPI dēta-ni-okeru jōken hyōgen-no shūtoku kenkyū: chūgokugo, kankokugo, ēgo bogo washa-no shizen hatsuwa-kara [An acquisition study of conditional sentences based on OPI data: natural speech of Chinese, Korean and English speaking learners of Japanese]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 111. 26–35.
- Noda, Hisashi, Kumiko Sakoda, Katsumi Shibuya and Noriko Kobayashi. 2001. *Nihongo gakushū-sha-no bumpō shūtoku* [Grammar acquisition of Japanese as a second language]. Tokyo: Taishukan.
- Noda, Hisashi (ed.) 2005. *Komyunikēshon-no tame-no Nihongo-kyōiku-bumpō* [JSL teaching for communication]. Tokyo: Kurosio.
- Ogiwara, Chikako, Masako Masuda, Mariko Saito and Yokumi Ito. 2005. *Nihongo jōkyū washa-e-no michi* [Road to an advanced Japanese speaker: Good communication skills and expressions]. Tokyo: 3A Corporation.
- Ozeki, Hiromi. 2008. Dai-ichi/dai-ni gengo shūtoku-ni-okeru Nihongo mēshi shūshoku-no shūtoku katē [The acquisition process of Japanese noun-modifying clauses by first and second language learners]. Tokyo: Kurosio.
- Ozeki, Hiromi and Yasuhiro Shirai. 2007. Does the noun phrase accessibility hierarchy predict the difficulty order in the acquisition of Japanese relative clauses?, *Studies in Second Language Acquisition*, 29(2), 169–196.
- Piao, Xian-Hua. 2010. OPI dēta-ni miru Nihongo gakushū-sha-to Nihongo bogo washa-ni-yoru bumatsu hyōgen-no shiyō: setsuzoku joshi-de owaru iisashi hyōgen-o chūshin-ni [Sentence-final expressions by Japanese native speakers and L2 learners in OPI data: with special reference to sentences with connectives]. *Issues in Language and Culture* 11. 217–235.
- Quackenbush, Hiroko (ed.). 1999. *Dai-ni gengo-to-shite-no Nihongo-no shūtoku-ni kansuru sōgō kenkyū* [Comprehensive research on the acquisition of Japanese as a second language]. JSPS research project report.
- Reichenbach, Hans. 1947. *Elements of symbolic logic*. New York: Macmillan & Co.
- Sakakibara, Yoshimi. 2008. Shōsai-na jojutsu-no kōka-teki-na shidō-o mezashite: kōpasu-ni-motozuku kōsatsu [Effective instructions for detailed description]. *15th Princeton Japanese Pedagogy Forum*. 81–92.
- Sakoda, Kumiko. 1999. Dai-ni gengo gakushū-sha-ni-yoru *no*-no fuka-ni-kansuru goyō [Errors associated with *no* 'of' by L2 learners of Japanese]. In Hiroko Quackenbush. (ed.), *Dai-ni gengo-to-shite-no Nihongo-no shūtoku-ni kansuru sōgō kenkyū* [Comprehensive research on the acquisition of Japanese as a second language], 327–334. JSPS research project report.
- Sheu, Shiah-pei. 2000. Shizen hatsuwa-ni-okeru Nihongo gakushū-sha-ni-yoru *teiru*-no shūtoku kenkyū: OPI dēta-no bunseki kekka-kara [Study on acquisition of *teiru* in L2 learners' natural speech]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 104. 20–29.

- Shibuya, Katsumi. 2001. Gakushū-sha-no bogo-no ēkyō [Influence of learners' native languages]. In Hisashi Noda, Kumiko Sakoda, Katsumi Shibuya and Noriko Kobayashi, *Nihongo gakushū-sha-no bumpō shūtoku* [Grammar acquisition of Japanese as a second language], 83–99. Tokyo: Taishukan.
- Shimada, Kazuko. 2008. *Mezase, Nihongo kyōshi-ryoku appu! OPI-de ikiiki jugyō* [Road to a greater Japanese teacher: Lively classes with OPI]. Tokyo: Hituzi Syobo.
- Surface, Eric A. and Erich C. Dierdorff. 2003. Reliability and the ACTFL Oral Proficiency Interview: reporting indices of interrater consistency and agreement for 19 languages. *Foreign Language Annals* 36 (4). 507–519.
- Tanaka, Mari. 2001. *Nihongo-no shiten, voisu-ni-kansuru shūtoku kenkyū: Ēgo, Kankokugo, Chūgokugo, Indoneshiago, Marēgo washa-no baai* [The acquisition of point of view and voice in Japanese as a foreign/second language: The case of adult learners of English, Korean, Chinese and Indonesian/Malay]. Unpublished Ph.D. dissertation. International Christian University.
- Toda, Takako and Hiroko Quackenbush. 1999. Chūkan gengo-ni-okeru gairai-go akusento-no kēsē-to nihon-jin washa-ni-yoru hyōka [Japanese accent formation of loan words in interlanguage and their evaluation by native speakers]. In Hiroko Quackenbush (ed.), *Dai-ni gengo-to-shite-no Nihongo-no shūtoku-ni kansuru sōgō kenkyū* [Comprehensive research on the acquisition of Japanese as a second language], 279–296. JSPS research project report.
- Yamauchi, Hiroyuki. 1999. OPI oyobi KY kōpasu-ni-tsuite [OPI and KY corpus]. In Hiroko Quackenbush (ed.), *Dai-ni gengo-to-shite-no Nihongo-no shūtoku-ni kansuru sōgō kenkyū* [Comprehensive research on the acquisition of Japanese as a second language], 238–278. JSPS research project report.
- Yamauchi, Hiroyuki. 2000. *Rōru purē-de manabu chūkyū-kara jōkyū-e-no Nihongo kaiwa* [Towards advanced Japanese conversation with role playing]. Tokyo: ALC Press.
- Yamauchi, Hiroyuki. 2004. Goi-shūtoku-kenkyū-no hōhō: ChaSen-to N-guramu-tōkē [Methods of studies on vocabulary acquisition: ChaSen and N-gram analysis]. *Dai-ni Gengo-to site-no Nihongo-no Shūtoku Kenkyū* 7: 141–162.
- Yamauchi, Hiroyuki. 2005. *OPI-no kangae-kata-ni-motozuita Nihongo kyōju-hō: hanasu nōryoku-o takameru-tame-ni* [Pedagogy of JSL based on OPI idea: Towards higher ability of speaking]. Tokyo: Hituzi Syobo.
- Yamauchi, Hiroyuki. 2009. *Purofishienshī-kara mita Nihongo kyōiku bumpō* [Japanese L2 education in terms of proficiency]. Tokyo: Hituzi Shobo.
- Yao, Yan-Ling. 2004. Chūgokugo bogo washa-no Nihongo ji-ta-dōshi-no shiyō jittai: sakubun-to KY kōpasu-no bunseki-o tōshite [Use of Japanese intransitive and transitive verbs in Chinese L2 learners: analysis based on learners' writings and KY corpus]. *Higashi-Ajia Nihongo Kyōiku/Nihon Bunka Kenkyū* [East Asian Journal of Japanese Language education and Japanese Culture] 7. 261–287.
- Yui, Kikuko. 2009. Purofishienshī-to kaku nōryoku-no hikaku [Proficiency and writing skills of Japanese]. In Osamu Kamada, Hiroyuki Yamauchi and Ryoichi Tsutsumi (eds.), *Purofishienshī-to Nihongo kyōiku* [Proficiency in teaching Japanese as a second language], 221–239. Tokyo: Hituzi Syobo.

Hiromi Ozeki

12 Corpus-based second language acquisition research

1 Introduction

This chapter presents an overview of the current state of corpus-based second language acquisition (SLA) research. Specifically, this chapter discusses the role of learner corpora in the analyses of the developmental process of interlanguage. Learner corpora can provide new windows into the process of interlanguage and, ultimately, further our understanding of SLA.

Learner corpora are, according to Granger (2009: 14), “electronic collections of foreign or second language learner texts assembled according to explicit design criteria”. While learner corpora have received more attention in SLA research in recent years, this does not necessarily represent a completely new approach, because analyzing learners’ actual performance has been a central method since the early days of SLA research (Myles 2005). Language acquisition research has always been data-driven, which is different from other areas of linguistics that rely on researchers’ intuitions and examples. In the field of first language (L1) acquisition research, a considerable number of studies using corpora in the Child Language Data Exchange System (CHILDES) database (MacWhinney and Snow 1985) have been published over the past few decades. On the other hand, learner corpora have not been in the forefront of SLA research and fewer corpus-based studies in SLA have been published in international refereed journals; For example, only 32 corpus-based research articles¹ were identified in two SLA journals published in the past ten years (2003–2012), 16 in *Studies in Second Language Acquisition (SSLA)* and 16 in *Language Learning*, including studies using unpublished corpora collected by the authors of the articles (25 among 32 studies). Moreover, while several reviews or introductory articles on corpus-based SLA research have been written by corpus linguists (e.g., Granger 1998, 2002, 2009, 2012; Barlow 2005), only a few of these articles have been authored by SLA researchers (Myles 2005, Myles and Mitchell 2005). Although corpus-based SLA research has been addressed from the perspective of corpus linguists, it has not been discussed from the viewpoint of SLA researchers.

Turning now to research on second language learners of Japanese, a large number of studies have been conducted using learner corpora over the past ten years or so, and we may say that corpus-based research on Japanese language learners has become very common. While only a handful of Japanese learner corpora exist, one

¹ I included the studies using oral or written production data not experimentally elicited as “corpus-based studies”. I did not include those using the data collected to elicit specific linguistic features.

of them (i.e., K-Y corpus) provides well-designed cross-sectional oral data, which is rare, compared to most of the corpora in the field of SLA. However, there still have been few studies that have made theoretical contributions to the field. Given the situation of corpus based SLA research in general and on the acquisition of Japanese, it is crucial to consider how we can conduct corpus-based research that can contribute to SLA theories.

This chapter discusses issues related to corpus-based SLA research from the SLA researcher's perspectives. The chapter is organized as follows: Section 2 illustrates the role of learners' production data in SLA research. Section 3 describes the current state of corpus-based SLA research (SLA research in general and then research on acquisition of Japanese), and considers the gap in perspectives between corpus linguists and SLA researchers. Section 4 discusses possible contributions of corpus-based research to the field of SLA by presenting examples from L1 acquisition studies that have significantly impacted the field. Section 5 concludes the chapter and considers the type of learner corpora required for SLA research, and discusses best practices for using them.

2 SLA research using learners' production data

2.1 Learners' production data in SLA research

The earliest approach to SLA research is known as Error Analysis (EA). In the 1950s and early 1960s, the method most commonly used was Contrastive Analysis (CA), in which, believing that second language (L2) learners' errors are predictable from differences between the L1 and L2, researchers compared pairs of languages in order to identify their similarities and differences (e.g., Lado 1957). Later, it was shown that many of errors predicted by CA did not actually occur (e.g., Whitman and Jackson 1972). Thus, researchers began to study and analyze actual learners' errors. From the late 1960s to 1970s, many researchers (e.g., Corder 1967) carried out EA, describing and categorizing learners' errors. However, analyzing only learners' errors cannot offer a complete picture of learner language because it only tells us what learners cannot do (Schachter 1974). In the 1980s, EA gave way to interlanguage analysis, an approach that focused squarely on the language produced by learners (e.g., Larsen-Freeman and Long 1991), without regard to native speakers' norms. While current SLA research uses a variety of experimental methods, analyzing learners' actual language use has remained a central focus since the early days of the field.

According to Ellis and Barkhuizen (2005), data collected from learners can be classified as follows: (1) non-linguistic performance data, (2) samples of learner language, and (3) reports from learners about their own learning. Learner corpora are classified into the second type of learner data and considered samples of learner language. Ellis and Barkhuizen further divide samples of learner language into the

following three types: (1) naturally-occurring samples, (2) clinically-elicited samples, and (3) experimentally-elicited samples. Naturally occurring samples are oral or written natural production data over which the researcher exercises no control. Experimentally elicited samples are the data collected by methods designed to elicit a specific linguistic feature, such as multiple-choice grammar questions or sentence-completion. Clinically elicited samples are a blend of naturally occurring and elicited data, as they are elicited by researchers yet learners shape their responses and send messages. The methods used to collect these data include oral interviews, role-plays, and picture-composition tasks. Corpora in the field of L1 acquisition research typically consist of natural child-caregiver conversations. In contrast, naturally occurring oral samples are rare in the field of SLA; most of the corpora in SLA represent clinically elicited samples such as written compositions or oral interviews.

Though learner corpora can be classified within the existing data types, they are also different from traditional learner language samples in the following ways: First, a difference exists in data size; that is, large-size corpora make it possible for us to obtain more generalizable results. Second, learner corpora are computerized, and thus large amounts of data can be analyzed with software tools. Third, learner corpora can be easily shared among researchers. In this way learner corpora are expected to be very powerful tools for analyzing learner language.

2.2 SLA research on learners' oral production data

Learners' production data have always been central to SLA research. In the days of EA, learners' actual errors were described and classified. In the 1970s, a series of morphological studies were carried out to investigate the acquisition order of grammatical morphemes in English (e.g., Dulay and Burt 1973; Hakuta 1976). These studies used a method known as obligatory occasion analysis whereby researchers would examine how accurately learners used specific linguistic forms in their obligatory contexts. Both obligatory occasion analysis and EA are target-language-based where learner language is compared against target language norms (Ellis 1994). Ultimately, these methods "shed[s] little light on the actual processes involved in acquiring a second language" (Ellis and Barkhuizen 2005: 92).

In contrast, learners' interlanguage is the focus in Huebner's (1983) studies. He analyzed yearlong longitudinal data of Ge, a Hmong learner of English. He collected audio-recorded informal conversations with Ge from the very early stages of acquisition, and found systematicity in the way Ge used target forms such as 'da' (=the) and 'isa' (=it's a), and that the functions he mapped on these forms changed over time. Huebner's studies show that what appears to be random use in an obligatory occasion analysis turns out to be highly systematic (Ellis 1994). Huebner investigated the form-function relationships in learner language by performing a "form-to-functional analysis" to determine how learners use specific forms of target languages. This kind

of functional approach can also include a “function-to-form analysis” to determine how learners express specific functions or notions (e.g., temporal and spatial reference) in the target language (e.g., Sato 1990). In these functional approaches, longitudinal production data were typically used, which were usually collected by each researcher. Given the difficulties of collecting and transcribing longitudinal data, these functional studies are often small-scale case studies.

One large-scale project that collected learners’ longitudinal production data is the European Science Foundation (ESF) project, carried out in the 1980s in five countries: France, Germany, Great Britain, the Netherlands, and Sweden (Feldweg 1991; Perdue 1993). The research team collected data from 40 adult immigrants who were acquiring one of five target languages (English, German, Dutch, French, Swedish) in natural settings. Six L1s were represented (Punjabi, Italian, Turkish, Arabic, Spanish and Finnish), with two L1s for each target language. The data, which were collected over 2.5 years, included informal conversations, picture descriptions, role-plays, and silent movie re-tellings. The most widely known finding from the ESF project is that at the very early stages of acquisition, the learners, irrespective of their L1s, universally developed an efficient and simple form of the language called the Basic Variety (Klein and Perdue 1997). The ESF database is now available in the Codes for the Human Analysis of Transcripts (CHAT) format from CHILDES (MacWhinney 2000) on the web.

Although these studies of learners’ language have contributed to SLA research by showing how learners systematically use the target language during different stages of their acquisition, collecting such large samples of learner language is difficult. Compared to observational studies, experimental data present fewer challenges in terms of data collection and, as a result, have been widespread in SLA studies. The emergence of computerized learner corpora is expected to solve the problems of collecting learner language and may expand the possibilities of research on learner language.

3 Use of corpora in language acquisition research

As mentioned above, computerized learner corpora can be useful data for studying L2 acquisition. Nonetheless, they have so far been underused in SLA research. This section briefly overviews existing learner corpora and the issues related to corpus-based SLA research. I begin with a description of the current state of corpus-based L1 acquisition research and then turn to the field of SLA. Finally, I discuss studies on the acquisition of Japanese as a second language (JSL) as window into the potential usefulness of learner corpora in SLA research.

3.1 First language acquisition research

The state of L1 acquisition research was similar to that of SLA research before the emergence of computerized corpora. In the early days of L1 acquisition research, data were collected from small groups of children. Researchers used individual methods of transcription and transcribed every utterance collected. In the early 1980s, Brian MacWhinney and Catherine Snow started the Child Language Data Exchange System (CHILDES) Project, which provides computerized transcriptions of child language data and software analysis tools (e.g., Computerized Language Analysis [CLAN]) (MacWhinney and Snow 1985, 1990). The CHILDES database has made it possible for researchers to analyze large amounts of children's natural production data. A large number of L1 acquisition studies using this database have been published. For research of L1 acquisition of Japanese, the JCHAT project (Oshima-Takane et. al 1998) collects Japanese-speaking children's production data, and many researchers have made use of these corpora (for more details, see Miyata's chapter in this volume). The majority of corpora used in these studies are longitudinal oral data, which are crucial for investigation of developmental processes. In this way, it has been possible to carry out longitudinal L1 acquisition studies involving several children, something that has not yet been possible in SLA research (e.g., Ozeki 2008; Ozeki and Shirai 2010, which analyzed longitudinal data from five Japanese-speaking children for investigating the development of relative clauses).

3.2 Second language acquisition research

3.2.1 SLA research on learner corpora

While corpora in L1 acquisition research provide mostly naturally occurring longitudinal oral data, the majority of L2 learner corpora are written, and longitudinal corpora are very rare. The most extensive and commonly used learner corpus is the International corpus of Learner English (ICLE) (Granger 2003), which includes essays written by advanced EFL learners with various L1s. In fact, very few L2 learner corpora exist involving oral data. This may be the case because written corpora are easier to collect compared to oral corpora, particularly if learners write their essays in electronic form. One of the few exceptions is The National Institute of Information and Communications Technology: Japanese Learner of English (NICT JLE) corpus (Tono et al. 2001), which consists of oral interviews from 1,281 Japanese learners of English during oral proficiency tests.

The majority of the studies that use learner corpora examine learners' errors, over- or under-use of target linguistic forms, that is, learners' more frequent use or less frequent use compared with native speakers', or collocations in learner language. Granger (1998, 2002, 2009, 2012) proposes two methods to analyze learners'

interlanguage using learner corpora, Contrastive Interlanguage Analysis (CIA) and Computer-aided Error Analysis (CEA). CIA involves two types of comparisons: comparisons between L1 (native speakers' data) and L2 and between L2s of speakers of different L1s. According to Granger (2002: 12), the first type of comparisons "are intended to shed light on non-nativeness of features of learner writing and speech through detailed comparisons of linguistic features in native and non-native corpora." The second type, which compares different groups of learners, assesses the influence of several variables, such as L1s, proficiency, or age. Many studies on learner corpora carry out CIA and compare frequencies of specific words or grammar constructions in learner corpora with those in native corpora to determine whether learners overuse or underuse them.

As for CEA (Computer-aided Error Analysis), whereas EA (error analysis) is no longer considered an appropriate method in SLA because only analyzing learners' errors cannot provide complete pictures of language development, Granger (2002, 2009) argues that CEA can resolve the problems of traditional EA. For example, CEA can offer more reliable data on learners' errors than traditional EA because larger samples are used (Granger 2002). Moreover, according to Granger, CEA makes it possible to extract correct uses of specific forms as well as errors in order to compare correct and erroneous uses. Error-tagging is a key feature of CEA (Barlow 2005; Granger 1998, 2002), which allows researchers to annotate information for each token such as error type and word category. Many corpus linguists are attempting to develop error-tagging systems in order to construct error tagged corpora.

A growing number of SLA studies use learner corpora. Altenberg and Granger (2001) examined the use of the verb *make* by Swedish L1 and French L1 ESL (English as a second language) learners in the ICLE corpus, and compared it with the use of native English speakers. Their results showed that French L1 learners underuse *make* as a whole, and that Swedish L1 learners overuse causative *make* while French L1 learners underuse this form. They further analyzed which words are often used with causative *make*, finding that the co-occurrence patterns for the ESL learners differ from those of native speakers and that there are similarities and differences between the L1 groups. Comparing the use of English modals by Swedish learners of English in the ICLE corpus with that of English native speakers, Aijmer (2002) found: (1) Swedish L1 learners overuse English modal auxiliaries, and (2) they especially use *will*, *must*, *have (got) to*, *should*, and *might* much more frequently than native speakers. Her results also showed that different L1 groups overuse different modals. In another study, De Cock et al. (1998) investigated collocations in learner corpora, and found that the chunks that learners use are not necessarily the same as those used by native speakers and are not used with the same frequency.

The findings of these studies show the unique advantages of large-scale and automated corpus-based analysis in SLA research. Yet, these studies do not provide any explanation of the developmental process of interlanguage. In fact, Myles (2005: 380) pointed out that the SLA studies using learner corpora "often remain rather

descriptive, documenting differences between learner and native languages rather than attempting to explain them, and the developmental dimension is almost totally lacking.”

Unfortunately, few corpus-based SLA studies examine the developmental process, as Myles pointed out. One notable exception is Housen (2002), which used the corpus of Young Learner Interlanguage (CYLIL), which involves CHAT-formatted longitudinal data and cross-sectional data elicited from EFL (English as a foreign language) learners (ages of 9–17) with different L1 backgrounds (Dutch, Greek, French and Italian). In his study, Housen analyzed data from 23 Dutch-speaking learners and 23 French-speaking learners to test the Aspect Hypothesis (Andersen and Shirai 1996). Although this kind of study is extremely useful for understanding the developmental process, it is also very rare because of the lack of available learner corpora in this area.

3.2.2 Problems of CIA and CEA

One disadvantage of using CIA (Contrastive Interlanguage Analysis) and CEA (Computer-aided Error Analysis) to analyze learners' interlanguage is that these methods can lead to the “comparative fallacy” (Bley-Vroman 1983). The comparative fallacy is “the mistake of studying the systematic character of one language by comparing it to another” (Bley-Vroman 1983: 6). Gass and Selinker (2008: 51) argue that “a goal of SLA research is to discover the system underlying a second language. Comparing second language forms to TL [target language] standards may lead analysts down a path that precludes an understanding of the systematic nature of the learner system in question.” Comparing frequency of specific target items to that of native speakers or focusing on learners' non-nativeness ignores the systematic nature of second language use. Acknowledging these criticisms, Granger (2009, 2012) argues that the comparative fallacy is pervasive in non-corpus-based SLA studies as well. Granger (2009: 18-19) writes that “all the studies that compare learners of different proficiency levels are in fact based on an underlying L1 norm as proficiency is usually assessed with an L1 target in mind.” In these cases, however, proficiency levels are used to investigate learners' development, and the systematicity of learner language can be discovered if the analysis does not rely on L1 norms.

To defend CIA against the criticisms, Granger (2012) also argues that L1–L2 comparisons are powerful heuristic techniques that help shed light on new features of learner language. At this point, her statement makes sense: the comparison itself is not the primary problem. However, the problem is the failure to study the systematicity and autonomous nature of interlanguage because of comparisons to the “norm”. In fact, it is common in SLA research to collect the baseline-data from native speakers in order to provide crucial information for the interpretation of

learner language. For example, Ozeki and Shirai (2007a) analyzed Japanese noun-modifying clauses in learner corpora and obtained results showing that learners rarely use noun-modifying clauses to denote progressive action (e.g., “*hon o yondeiru hito*”: the man reading a book). Their results from the native speaker corpus, however, show the same tendency, which indicates that infrequent use of this type of noun-modifying clauses is not a specific feature of interlanguage but the result of topic-influences or other reasons. This finding suggests that the interpretation of results from learner corpora may result in misinterpretation without a comparison with native speaker corpora. The point is that this type of comparison is substantially different from using native corpora as “norms”.

The idea that L1 usage should not be regarded as norms or standards is not limited to corpus-based SLA research, but any kind of interlanguage analysis as well. When linguists compare languages (e.g., English and Japanese), they never regard one language as the norm. Likewise, interlanguage analyses require the same kind of comparison. For example, we can first analyze learners’ collocations with *make* to understand their own systematic systems of use, generate some generalizations without looking at native speakers’ corpora, and then compare learners’ usages with that of native speakers. This minor change in the methodology can greatly reduce the chances of falling into the trap of the comparative fallacy.

As for CEA (Computer-aided Error Analysis), Myles (2005: 378) noted that the method is “undoubtedly of interest to teachers, but probably less so to SLA researchers who have moved away from looking at learner language in terms of its deviations.” Whereas Granger (1998) claimed that CEA can solve the major problems that traditional EA (error analysis) cannot solve, EA is still EA in the end. Even larger data sizes cannot solve the problem of EA because, ultimately, EA can only reveal what learners cannot do. Moreover, CEA relies on extracting errors and correct uses from corpora for the purposes of comparison, which is similar to the EA approach. Comparing correct and incorrect usage according to L1 norms cannot reveal the independent system in learner language because of the comparative fallacy.

These methods approach interlanguage from, in Klein’s (2011: 28) term, “the target deviation perspective”, and view learner language “not in terms of what the learner does but in terms of what he or she fails to do”, although he does not specifically refer to the CIA and CEA. The goal of SLA research is to discover the system underlying a second language, not to reveal “non-nativeness” in learner language or analyze how learner language deviates from the target norms. While Granger (1998: 6) notes that learner corpora “give us access not only to errors but learners’ total interlanguage”, it is up to researchers to use these corpora effectively to provide a full understanding of learners’ total interlanguage. “Backsliding” of SLA research by using methods that rely on “the target deviation perspective” should be avoided. Currently, a gap exists between corpus-based SLA research from the viewpoint of corpus linguists and SLA researchers, which may be the reason that, as

stated previously, there is only a small number of corpus-based SLA studies published in refereed SLA journals such as *SSLA* and *Language Learning*.

3.2.3 Problems with existing learner corpora

Another reason why so few refereed articles on L2 acquisition using learner corpora have been published is the lack of available corpora that SLA research requires. In most of the corpus-based acquisition studies published in *SSLA* and *Language Learning*, researchers collected their own corpus data for their research. In other words, there have been few publicly available learner corpora used in these studies.

As stated previously, the majority of learner corpora are made up of written data such as learners' essays. Myles (2005: 311) argues that oral data is essential for SLA research because "[it] may be relatively free of metalinguistic interference than written data, which is complicated by additional layers of learnt knowledge and monitoring processes." Task variability also influences results in SLA research, and when using written learner corpora, analysts must keep in mind from which knowledge the learners performance comes. In fact, there have been only three studies using written learner corpora (Laufer and Waldman 2011; Schoonen et.al 2011; van Compernelle & Williams 2009) in *SSLA* and *Language Learning* published in past ten years.

Another reason may be that most of the available learner corpora consist of performance data from intermediate to advanced learners. Longitudinal corpora (e.g., ESF database), on the other hand, are extremely rare. Cross-sectional corpora, which involve learners of various proficiency levels, are also rare (e.g., CYLIL used in Housen's (2002) study). For example, the ICLE corpus, the most large-scale learner corpus, includes data from only advanced learners. Given the goals of language acquisition research, these missing ingredients from existing learner corpora are significant disadvantages because longitudinal data and cross-sectional data are indispensable in order to study development. Thus, studies emerging from these corpora tend to only examine what kind of errors advanced learners make, or how their performances deviate from the native speaker "norm".

In this respect, the ESF database mentioned earlier is extremely valuable and, because it is now available in the CHILDES database, has been used for several studies that have made theoretical contributions. For example, Ellis and Ferreira-Junior (2009) analyzed the developmental process of English verb-argument constructions to show that learners first use the most frequent, prototypical, and generic exemplar. In order to make theoretical contributions to the field of SLA, corpora that allow us to analyze the developmental process are necessary. Many of the corpora collected by the authors of corpus-based studies published in *SSLA* and *Language Learning* are longitudinal or cross-sectional oral data (e.g., Crossley, Salsbury and McNamara

2009; Zhang 2004). This shows that SLA researchers need the corpora that can show developmental patterns.

3.3 corpus-based SLA research in the field of JSL acquisition research

3.3.1 Learner corpora of L2 learners of Japanese

The current state of learner corpora in JSL acquisition research is actually somewhat different from what I have described so far. While only a handful of corpora exist in this field, some of them provide oral data; a well-designed cross-sectional corpus also exists. The most commonly used corpus for JSL acquisition research is the KY corpus (Kamada 1999), which consists of transcribed ACTFL OPI interviews from 90 JSL learners (see the chapter by Lee and Nakagawa in this volume for further details on this corpus). The learners' L1s are English, Korean, and Chinese (N = 30 for each L1 group). The corpus includes learners at different proficiency levels (novice, intermediate, advanced, and superior). Compared to most of the corpora in SLA, the KY corpus is rare because it provides oral performance data from learners at various levels with three different L1 backgrounds. Although the data in KY corpus is not natural data, this kind of near-natural spontaneous performance data is equally important. The KY corpus has been actively used in Japanese L2 acquisition research. Major SLA studies published in refereed journals that have used the KY corpus are Sheu (2000) on aspect, Neancharoensuk (2001) on conditionals, Ozeki (2005) and Ozeki and Shirai (2007a) on noun-modifying clauses, Mine (2007) on conjunctions in complex sentences, and Geyer (2007) on contrastive markers, such as *demo*, *kedo*, and *ga* (for more details, see Lee and Nakagawa in this volume).

Another corpus that includes OPI interviews is the Database of Japanese Language Learners' Conversation (Kokuritsu Kokugo Kenkyūjo 2010) recently made publicly available by the National Institute for Japanese Language and Linguistics (NINJAL). This corpus includes OPI interviews from 339 learners of Japanese, including audio data from 251 of these learners. The learners' L1s are Korean (N = 207), Chinese (N = 66), English (N = 30), and Indonesian (N = 14), among others. The corpus also makes available the proficiency level data provided by the OPI testers. Although it is not as systematically organized as the KY corpus, the large amount of audio data of learners' spontaneous speech can be used for a wide range of research.

The NINJAL also constructed a large-scale corpus of learners' essays, namely, the Multilingual Database: Essays and Translations by Learners of Japanese Language (Taiyaku DB: Usami 2006). This corpus includes essays written by learners in Japanese, the learners' own translation of their essays in their L1s, and error

corrections made on the essays by the Japanese language teachers, although the error corrections are not available for all the essays. So far, 1,754 essays have been made available on the web. Data were collected in 22 countries or regions including Japan. Despite its large-scale, however, there is no information provided on learners' proficiency except for their years of experience of learning Japanese. This makes it difficult to conduct research with controlled proficiency levels of learners. For this reason, most of the studies using the Taiyaku DB focus on second language writing research and analyze the construction of learners' essays or investigate teachers' evaluations of these essays. One of the notable exceptions is Kiyama (2003). Kiyama used this corpus to investigate interlanguage and analyzed the developmental process of conjunctive particles without using learners' proficiency data. She analyzed the use of conjunctive particles in adverbial clauses (e.g., *-te*, *-tara*) by Malaysian L1 learners of Japanese. She divided the learners into groups by the number of types of conjunctive particles used in each learner's essay (i.e., two types group, three types group, etc.) and then classified the conjunctive particles used in each group. Using the results of this analysis, she proposed the order of emergence of conjunctive particles in the developmental process. This analysis is similar to implicational scaling, which seeks to identify implicational relationships between several features. For corpora in which learners' proficiency levels are not clear, implicational scaling is a useful research tool.

The Language Acquisition Research Project at Soochow University (LRAP at SCU) is a longitudinal corpus constructed in Taiwan. It consists of essays and conversations from 37 university students learning Japanese. Data were collected once a month for 3.5 years, including essays written by learners, transcriptions of follow-up interviews with the learners regarding the essay topics, including the feedback on their essays, and essays rewritten by learners after the follow-up interviews. Note that this corpus is still under construction, and it is advised that researchers confirm transcriptions with original audio data because confirmation and modification procedures on the transcripts have not yet been completed.

Another learner corpus called the corpus of Japanese as a Second Language (C-JAS) was made publicly available by NINJAL in 2012. This corpus includes longitudinal data in the form of oral interviews from three Chinese L1 learners and three Korean L1 learners. Data were collected every three or four months from the early stages of acquisition, that is, 3 months after they had started learning Japanese. Total amount of conversations is 46.5 hours involving about 800,000 words with annotations of morphological information and errors.

As for narrative data, the Inaba corpus (Inaba 2007) in Japanese CHILDES corpora includes Frog Story narratives from 50 English speaking learners of Japanese with five proficiency levels (see Miyata's chapter in this volume). "Frog Story" (Mayer 1969 "Frog, Where are you?") is a picture book material to elicit narratives, which has been widely used in the areas of L1 acquisition. The Inaba corpus includes narratives from Japanese L1 adults and children, and also includes English version

of the story from L2 learners, and therefore analysis can be done from various perspectives.

3.3.2 Problems of corpus-based JSL acquisition research

corpus-based research is very common in the field of JSL acquisition. Nevertheless, a large number of these studies perform EA or are simply descriptive. Although it is necessary to describe learner language based on the actual language use, the goal of SLA research is to uncover the mechanism of second language acquisition, and description is only the first step. We should use descriptive analyses to build hypotheses that can make theoretical contributions to the literature. Examples of this approach are Neancharoensuk (2001) and Geyer (2007). Neancharoensuk analyzed conditional expressions used by learners in the KY corpus and proposed a hypothesis regarding the developmental sequences of Japanese conditionals. Geyer analyzed learners' use of contrastive markers, such as *demo*, *kedo*, and *ga* from the perspective of interlanguage pragmatics. She examined their use of "qualification segments" expressed with these contrastive markers, which are used to reduce the force of the speaker's own utterances, and showed the close relationships among pragmatic, grammatical, and discourse competences.

Another way to make a theoretical contribution using learner corpora is to link the research to current SLA theories or previously proposed hypotheses. For example, Mine (2007) investigated the emergence of conjunctions in adverbial clauses by learners in the KY corpus and explained her results in terms of Pienemann's (1998) Processability theory. Similarly, Ozeki (2008) and Ozeki and Shirai (2007a) analyzed the effect of a proposed typological universal [Noun Phrase Accessibility Hierarchy (NPAH): Keenan and Comrie 1977] on learners' use of relative clauses using the KY corpus. They pointed out that the results obtained from learners of Japanese are very different from results from the learners of European languages, calling into question the difficulty hierarchy, which had been widely thought to be universal.

As shown in these studies, the end goal of SLA research is not be to simply describe learners' errors or tendencies, but explain the results in the context of SLA theories. Large-scale learner corpora can make it possible to access and describe actual learners' usage, build new hypotheses, and ultimately propose new explanations and analyses.

It is also possible to make research more contributive by combining analyses of learners' actual language use and experimental methods. For example, Ozeki and Shirai (2007a) above present both a corpus study and experimental study. Their Study 1, which is a corpus study, generated a hypothesis, which they tested in their Study 2, an experimental study. In their Study 1, they analyzed 1005 relative clauses (RCs) in the KY corpus. Results show that, while the NPAH predicts that subject (SU)

relatives are easier than direct object (DO) and oblique (OBL) relatives, even lower proficiency learners of Japanese used DO and OBL relatives, suggesting that SU relatives are not easier than DO or OBL relatives for second language learners of Japanese. Furthermore, they found that the learners (except Korean NSs) made strong associations between SU and animate heads and between DO/OBL and inanimate heads. Based on these results, Ozeki and Shirai hypothesized that L2 learners of Japanese can produce marked RCs even at the early stages of their language development, and that the animacy of head nouns strongly influenced the production of different types of RCs. Following these hypotheses, they conducted a sentence-combining experiment (Study 2) on fifty NSs of Cantonese studying Japanese in Hong Kong, which controlled for the animacy of head noun phrases and arguments of the verbs. Results revealed no significant difference between SU and DO, which were both easier than OBL, with only a minimal effect of animacy. However, errors of converting DO and OBL target items into SU relatives almost exclusively involved animate-head items. From the two studies, they concluded that the NPAH might not predict the acquisition of RCs in L2 Japanese as accurately as in L2 European languages, and proposed explanations based on typological differences between Japanese noun-modifying clauses and European type RCs (Matsumoto 1997; Comrie 1996).

The associations that Ozeki and Shirai found in their corpus study (study 1) could not be easily found in purely experimental studies, as experimental studies are strictly controlled for variables based on the researchers' hypothesis, and therefore they are suitable for testing whether the hypothesis is supported or not, but they don't allow us to find unexpected associations or form-meaning mapping that are found in learner language. Only learner corpora can show us what learners actually do. However, it is difficult to get generalizable results on linguistic items that second language learners don't produce frequently (e.g., relative clauses). Therefore, if these two methods are combined and used in a complementary way, the results can be much more powerful.

4 Possible contributions of corpus-based acquisition research

Taking into account the aforementioned issues with learner corpora in SLA research, this section discusses seminal research in L1 English acquisition that have significantly impacted the field, and considers the possible contributions of corpus-based acquisition research

Research on RC acquisition has focused on the effect of grammatical relations between the RC and the head nouns on the difficulty of RCs. L1 acquisition studies typically involve comprehension experiments using test sentences such as “the

horse that chased the rabbit kicked the sheep.” However, Diessel and Tomasello (2000) analyzed longitudinal conversational data from four English-speaking children from the CHILDES database, and found that children rarely, if ever, produce the sentence types used in many experimental studies, that is, a transitive sentence with another embedded transitive sentence. Instead, they found that children’s RCs emerge in the predicate of copula clauses (e.g., predicate nominals and existential constructions such as “Here’s a tiger that’s gonna scare him”) (Diessel and Tomasello 2000). Moreover, they showed that children’s early RC constructions express only a single proposition despite containing two clauses and gradually develop into fully fledged RCs. This finding shows that the analysis of actual language use can reveal patterns about the emergence of particular linguistic items, the functions they have, and the sequences in which they develop.

Later, Diessel and Tomasello (2005) conducted experimental research on the basis of their earlier findings, using test sentences with copula-clauses. These studies have made a significant impact in the area of L1 acquisition of RCs, and since then, several corpus-based studies on children’s RCs have been published. For example, Kidd et al. (2007) found that when both English L1 and German L1 children produce object-gap RCs, they most often do so with an inanimate head noun and a pronominal RC subject (e.g., the book you read). These researchers carried out a sentence repetition test as well, and the results also showed that the children performed best on the same type. In fact, this construction is the same as the RC pattern identified in Reali and Christiansen’s (2007) experimental study as being easy to process for adult native speakers. Moreover, this pattern is the one that Fox and Thompson (1990) pointed out to be frequently used in English conversations because of functional demands. The results from this wide range of studies (i.e., a corpus-based L1 acquisition study, L1 experimental study, a processing study, and an adult corpus study) suggest that the high frequency of pronominal object relative constructions, which may be a consequence of discourse demands, influences processing and acquisition (Kidd et al. 2007; Reali and Christiansen 2007). This case is an example showing how findings from corpus-based acquisition research and those from other areas can be integrated to make profound and important theoretical contributions.

The advantage of corpus-based analysis is the picture it provides of what actually happens with learners’ language use. Corpora allow us to see the patterns and understand their development. On the contrary, we cannot make interpretations about what does not happen in corpora. If some linguistic features do not appear in learners’ corpora, we cannot tell whether the learner has not yet acquired the features or has simply chosen not to use them. Thus, in corpus-based SLA research, we should look for what learners actually do, not what they cannot do, and explain it in terms of language development, following Diessel and Tomasello (2000) and Kidd et al. (2007). Learner corpora can show us how learners use the target language to express meanings in different types of contexts. Language acquisition involves the process of form-meaning mapping, and one way to see this process is to focus on how learners

actually use target languages, instead of what kind of errors they make, what they cannot do, or how they are deviant from native speakers.

5 Future learner corpora and corpus-based SLA research

5.1 Corpora necessary for SLA research

As we have seen so far, corpus-based SLA research is still in its infancy, and one of the reasons for this is the lack of appropriate corpora for SLA research needs. This section describes the kind of learner corpora from which SLA research could benefit.

(1) Corpora that allow us to analyze the developmental process

Longitudinal oral corpora, such as the ESF corpus, are critically needed for SLA research. For JSL research, the C-JAS longitudinal corpus of Japanese learners was made publicly available. Nevertheless, it is limited to native Korean and Chinese speakers of Japanese-language learners. More longitudinal corpora of learners with various L1 backgrounds are needed, as well as cross-sectional oral corpora with reliable proficiency levels, such as the KY corpus.

(2) Corpora with descriptions of basic information for each learner

While the KY corpus is a well-designed cross-sectional corpus, it does not provide background information on the learners, such as whether they are classroom learners. Future learner corpora should include such basic information about learners.

(3) Software tools and annotation

Although computerized corpora make analysis of target items extremely fast and easy with various software tools, tools such as error-tagging might not be necessary for SLA research (e.g., Rastelli 2009; Ragheb and Dickinson 2011). Error annotation in relation to L1 norms is problematic in SLA, because it was shown several decades ago that errors cannot be categorized and interpreted easily (Ellis 1994). This problem with error categorization has not yet been resolved, and Ragheb and Dickinson (2011) point out that there is a lot of subjectivity in the process of error annotation and interpretation. Some researchers (e.g., Ragheb and Dickinson 2011; Rastelli 2009) have proposed annotation systems that are more useful for SLA research. We need further discussion on appropriate tagging systems for SLA research. At any rate, error tagging should not delay the release of corpora because, if necessary, it can be done after the corpora are made publicly available.

(4) Use of the CHILDES system

As Myles (2005) and Rutherford and Thomas (2001) point out, it is necessary to transcribe the data in CHAT format in the CHILDES system so that CLAN can be used with the corpora for SLA research. Only a few SLA corpora have used the CHILDES system. While the software tools commonly used in learner corpora are ones that were developed for native speaker corpora, the CHAT system and CLAN were developed specifically for language acquisition research.

One of the main advantages of CHAT formatted files is the possibility for researchers to add codes to the target linguistic items to make their own CHAT files for their research. For example, I have created files for analysis of L1 acquisition of noun-modifying clauses in Japanese, adding various codes on each noun-modifying clause in order to classify them according to different factors (see Ozeki and Shirai 2007b, 2010). In this way, it is possible to use CLAN to search and perform quantitative and statistical analyses according to each of these various factors.

Another advantage of the CHILDES system is that we can easily go back to the original context in which each linguistic item is used. In SLA research, it is necessary to carefully analyze how each item is used in its original context, and the ability to return to the original context quickly represents a minimum requirement for SLA learner corpora. Thus, the tools commonly used in corpus linguistics such as KWIC (Key Word In Context) need to be equipped with easy one-click access to original context.

(5) Corpora that can provide information about input frequency

One of the important factors considered to affect learners' language use is input frequency. Slobin (2011: 251) notes that "great advances in understanding FLA [first language acquisition] have been facilitated by detailed calculations of input statistics, using large-computer-based corpora of child caregiver discourse." On the other hand, as for SLA, he pointed out that "we lack comparative quantitative data of the speech addressed to adult learners" (Slobin 2011: 251).

In the case of SLA, although the input each learner is exposed to varies greatly, and it is almost impossible to collect actual input data for each learner, we do need some data that can provide the general type of speech addressed to L2 learners. In English, there are publicly available corpora of teacher talk addressed to ESL learners in the classroom (Springer and Collins 2008). Ishizaki (2002) collected conversational data from an advanced learner of Japanese with many Japanese native speakers by having the learner carry an MD recorder with her for two days and record her conversations, although this data is not publicly available. These kinds of corpora would be helpful.

Another way to obtain information on input frequency is to use corpora of oral conversations from native speakers. Even though these corpora cannot be input data, they can serve as a useful reference to consider input frequency for L2 learners.

Although such English corpora of these kinds are abundant in the Talkbank database (MacWhinney 2000), only a few of these are available for native speakers in Japanese, so more are needed.

5.2 corpus-based SLA research in the future

Until now, studies on interlanguage using learners' actual production data have required considerable amounts of time for data collection. Computerized corpora can speed up this process, allowing more time for analysis and explanations. On the other hand, a common pitfall with corpus-based research is that it can lead to number-crunching research, in which analysts extract specific items, classify them according to L1 criteria, and perform statistical analyses on the number of their occurrence. In fact, some SLA papers using learner corpora presented in academic meetings or submitted to journals only mention the numbers of occurrence or frequency, ignoring how these features are actually used. In SLA research, analysis without careful observation of each usage may result in inadequate conclusions, because L2 learners shape their utterances according to their own form-meaning mapping and systematicity, which we cannot always predict. To make effective use of the large-scale samples provided by computerized corpora, we should carefully analyze learners' form-meaning mapping and its development while also using convenient tools for extraction and classification of data. SLA research needs more hybrid analyses that combine both quantitative and qualitative approaches, especially in terms of corpus-based research.

It is also possible, as mentioned earlier, to combine approaches used in corpus-based analyses of learners' actual language use and experimental research. Every research method has its own limitations, and it is better to combine methods of corpus-based approaches with experimental studies. Studies conducted on corpora alone are still useful; however, studies involving multiple approaches have the potential to make lasting theoretical contributions to the field of SLA.

In this chapter, I have described the current state of corpus-based SLA research. It is important to point out that learner corpora are not constructed only for SLA research, and many studies using learner corpora are useful for pedagogical research and application in the classrooms. Therefore, it is not necessary for all studies using learner corpora to make theoretical contributions to SLA research. On the other hand, as Cook (1999: 185) argued, "L2 users should be focused on in their own right rather than being compared with native speakers." Research on learner corpora, including pedagogical studies, should shift away from approaches that seek to identify learners' non-native features. Even if we identify ways learners deviate from native speakers, instruction does not necessarily result in the acquisition of the particular structures. The idea that the learners readily learn through instruction was called into question almost 30 years ago in the field of SLA (Ellis

1994). Instead, we can learn how to intervene with the learners' acquisition process only after investigation into their specific acquisition mechanisms.

Learner corpora can provide a very rich source of data on actual language use, and existing studies on learner corpora have provided several important findings on learner language. If these studies lack explanations, however, this will only result in piles of descriptions of learner language (or learners' non-nativeness) and little information about how they acquire their L2. To shed light on the mechanism of second language acquisition, it is necessary to explain the obtained results, and in order to do this, researchers must make connections to SLA theories. corpus linguists and SLA researchers must find new ways of working together. Until now, corpus linguists have conducted studies on learner corpora without making links to current SLA theories. On the other hand, SLA researchers may be reluctant to use new technologies. Myles (2005: 381) argues that "it is now time that corpus linguists and SLA specialists work more closely together in order to advance both their agendas", and Granger (2012: 8) also notes that the "LCR [learner corpus research] community wishes to situate itself firmly within the current SLA debate, simultaneously, there is a growing – though admittedly still limited – awareness among SLA specialists of the tremendous potential of learner corpora." The cooperation of corpus linguists, who have specialized knowledge on how to use the various tools on corpora, and SLA researchers, who know the issues and theories of SLA theories, will lead to new SLA research that has the potential to make significant contributions to the field.

Acknowledgments

This paper was supported by the Japan Society for the Promotion of Science (JSPS) Grants-in-Aid for Scientific Research Number 12020606.

References

- Aijmer, Karin. 2002. Modality in advanced Swedish learners' written interlanguage. In Sylviane Granger, Joseph Hung and Stephanie Petch-Tyson (eds.), *Computer learner corpora, second language acquisition and foreign language learning*, 55–76. Amsterdam: John Benjamins.
- Altenberg, Bengt and Sylviane Granger. 2001. The grammatical and lexical patterning of MAKE in native and non-native student writing. *Applied Linguistics* 22(2). 173–195.
- Andersen, Roger W. and Yasuhiro Shirai. 1996. Primacy of aspect in first and second language acquisition: The pidgin/creole connection. In William C. Ritchie and Tej K. Bhatia (eds.), *Handbook of second language acquisition*, 527–570. San Diego, CA: Academic Press.
- Barlow, Michael. 2005. Computer-based analyses of learner language. In Rod Ellis and Gary Barkhuizen (eds.), *Analyzing learner language*, 335–369. Oxford, UK: Oxford University Press.

- Bley-Vroman, Robert. 1983. The comparative fallacy in interlanguage studies: The case of systematicity. *Language Learning* 33(1). 1–17.
- Cook, Vivian. 1999. Going beyond the native speaker in language teaching. *TESOL Quarterly* 33(2). 185–209.
- Corder, Pit S. 1967. The significance of learners' errors. *International Review of Applied Linguistics* 5(4). 161–170.
- Crossley, Scott, Tom Salsbury and Danielle McNamara. 2009. Measuring L2 lexical growth using hypernymic relationships. *Language Learning* 59(2). 307–334.
- De Cock, Sylvie, Sylviane Granger, Geoffrey Leech and Tony McEnery. 1998. An automated approach to the phrasicon of EFL learners. In Sylviane Granger (ed.), *Learner English on computer*, 67–79. London: Addison Wesley Longman.
- Diessel, Holger and Michael Tomasello. 2000. The development of relative clauses in spontaneous child speech. *Cognitive Linguistics* 11(1). 131–151.
- Diessel, Holger and Michael Tomasello. 2005. A new look at the acquisition of relative clauses. *Language* 81(1). 1–25.
- Dietrich, Rainer, Wolfgang Klein and Colette Noyau. 1995. *The acquisition of temporality in a second language*. Amsterdam: Benjamins.
- Dulay, Heidi C. and Marina K. Burt. 1973. Should we teach children syntax? *Language Learning* 23(2). 245–258.
- Ellis, Rod. 1994. *The study of second language acquisition*. Oxford, UK: Oxford University Press.
- Ellis, Rod and Gary Barkhuizen. 2005. *Analyzing learner language*. Oxford, UK: Oxford University Press.
- Ellis, Nick and Ferreira-Junior Fernnando. 2009. Construction learning as a function of frequency, frequency distribution, and function. *The Modern Language Journal* 93(3). 370–385.
- Feldweg, Helmut. 1991. *The European Science Foundation Second Language Databank*. Nijmegen: Max-Planck-Institute for Psycholinguistics.
- Fox, Barbara A. and Sandra A. Thompson. 1990. A discourse explanation of the grammar of relative clauses in English conversation. *Language* 66(2). 297–316.
- Gass, Susan M. and Larry Selinker. 2001. *Second language acquisition: An introductory course*, 2nd edn. Mahwah, NJ: Lawrence Erlbaum Associates.
- Geyer, Naomi. 2007. Self-qualification in L2 Japanese: An interface of pragmatic, grammatical, and discourse competences. *Language Learning* 57(3). 337–367.
- Granger, Sylviane. 1998. The computer learner corpus: A versatile new source of data for SLA research. In Sylviane Granger (ed.), *Learner English on computer*, 3–18. London/New York: Addison-Wesley Longman.
- Granger, Sylviane. 2002. A bird's eye view of learner corpus research. In Sylviane Granger, Joseph Hung and Stephanie Petch-Tyson (eds.), *Computer learner corpora, second language acquisition and foreign language teaching*, 3–33. Amsterdam: John Benjamins.
- Granger, Sylviane. 2003. The International corpus of Learner English: A new resource for foreign language learning and teaching and second language acquisition research. *TESOL Quarterly* 37(3). 538–546.
- Granger, Sylviane. 2009. The contribution of learner corpora to second language acquisition and foreign language teaching: A critical evaluation. In Karin Aijmer (ed.), *Corpora and language teaching*, 13–32. Amsterdam: John Benjamins.
- Granger, Sylviane. 2012. How to use foreign and second language learner corpora. In Alison Mackey and Susan M. Gass (eds.), *Research methods in second language acquisition: A practical guide*, 7–29. Malden, MA: Wiley-Blackwell.
- Hakuta, Kenji. 1976. A case study of a Japanese child learning English. *Language Learning* 26(2). 321–351.

- Housen, Alex. 2002. A corpus-based study of the L2 acquisition of the English verb system. In Sylviane Granger, Joseph Hung and Stephanie Petch-Tyson (eds.), *Computer learner corpora, second language acquisition and foreign language teaching*, 77–116. Amsterdam: John Benjamins.
- Huebner, Thom. 1983. *The acquisition of English*. Ann Arbor, MI: Karoma.
- Inaba, Midori. 2007. Narrative discourse processing in first and second language development. Unpublished Ph.D. Dissertation. Nagoya: Nagoya University.
- Ishizaki, Akiko. 2002. Aru shizen shūtokuisha no ichinichi no hatsuwa ni okeru supīchi reberu shifuto: Kankokugo o bogo to suru jōkyū gakushūsha no hatsuwa shiryō o moto ni [The speech level shift in utterances by a naturalistic learner of Japanese: A case study of an advanced Korean L1 learner]. In *Heisei 12~13nendo kagaku kenkyūhi hojokin kenkyū: Dainigengo toshite no Nihongo no shizen shūtoku no kanōsei to genkai* [The report for Grant-in-Aid for Scientific Research 2000–2001: The possibilities and limitations of naturalistic acquisition of Japanese as a second language], 134–147. Tokyo: Ochanomizu University.
- Kamada, Osamu. 1999. KY-kōpasu to dainigengo toshite no nihongo no shūtoku kenkyū [KY corpus and acquisition research of Japanese as a second language]. In *Heisei 8~10nendo kagaku kenkyūhi hojokin kenkyū seika hōkokusho, Kiban kenkyū: Dainigengo toshite no Nihongo shūtoku kenkyū ni kansuru sōgō kenkyū* [The Report for Grant-in-Aid for Scientific Research 1996–1998: Comprehensive research on the acquisition of Japanese as a second language], 335–350. Nagoya: Nagoya University.
- Keenan, Edward and Bernard Comrie. 1977. Noun phrase accessibility and universal grammar. *Linguistic Inquiry* 8(1). 63–99.
- Kidd, Evan, Silke Brandt, Elena Lieven and Michael Tomasello. 2007. Object relatives made easy: A cross-linguistic comparison of the constraints influencing young children's processing of relative clauses. *Language and Cognitive Processes* 22(6). 860–897.
- Kiyama, Mika. 2003. Ren'yō shūshokusetsu o kōsei suru setsuzokujoshirui no shiyō jittai: Sakubun dētabēsu o mochiite [The development of conjunctive particles and 'te'-composing subordinate clause of learners of Japanese]. *Gengo Bunka to Nihongo Kyōiku* [Japanese Language Education] 25. 13–25.
- Klein, Wolfgang. 2011. A way to look at second language acquisition. In Marzena Watorek, Sandra Benazzo and Maya Hickmann (eds.), *Comparative perspectives on language acquisition: A tribute to Clive Perdue*, 23–36. Bristol: Multilingual Matters.
- Klein, Wolfgang and Clive Perdue. 1997. The basic variety (or: Couldn't natural languages be much simpler?). *Second Language Research* 13(4). 301–347.
- Kokuritsu kokugo kenkyūjo [National Institute for Japanese Language and Linguistics]. 2010. *Nihongo gakushūsha kaiwa dētabēsu no riyō tebiki* [The utilization guidance of Japanese Language Learners' Conversation]. Available on <https://dbms.ninjal.ac.jp/nknet/hokoku0604-2.pdf>
- Lado, Robert. 1957. *Linguistics across cultures*. Ann Arbor, MI: University of Michigan Press.
- Larsen-Freeman, Diane E. and Michael H. Long. 1991. *An introduction to second language acquisition research*. New York: Longman.
- Laufer, Batia and Tina Waldman. 2011. Verb-Noun collocations in second language writing: A corpus analysis of learners' English. *Language Learning* 61(2). 647–672.
- MacWhinney, Brian. 2000. *The CHILDES project: Tools for analyzing talk. Third edition*. Mahwah, NJ: Lawrence Erlbaum Associates.
- MacWhinney, Brian and Catherine E. Snow. 1985. The Child Language Data Exchange System. *Journal of Child Language* 12(2). 271–295.
- MacWhinney, Brian and Catherine E. Snow. 1990. The Child Language Data Exchange System: An update. *Journal of Child Language* 17(2). 457–472.
- Mayer, Mercer. 1969. *Frog, where are you?* New York: Dial Books for Young Readers.

- Mine, Fuyuki. 2007. Ninchiteki na sokumen kara mita dainigengo no hattatsu katei ni tsuite: Gakushūsha no shiyō suru setsuzokuji hyōgen no bunseki kekka o motoni [Cognitive factors on second language development: How learners develop their connective expressions in Japanese] *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 134. 90–99.
- Myles, Florence. 2005. Interlanguage corpora and second language acquisition research. *Second Language Research* 21(4). 373–391.
- Myles, Florence and Rosamond Mitchell. 2005. Using information technology to support empirical SLA research. *Journal of Applied Linguistics* 1(1). 69–95.
- Neancharoensuk, Suneerat. 2001. OPI dēta ni okeru jōkenhyōgen no shūtokukenkyū [An acquisition study of conditional sentences based on OPI data: Natural speech of Chinese, Korean and English learners of Japanese]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 111. 26–35.
- Oshima-Takane, Yuriko, Brian MacWhinney, Hidetosi Sirai, Susanne Miyata and Norio Naka (eds.). 1998. *CHILDES Manual for Japanese 2nd edn*. Nagoya: Chukyo University.
- Ozeki, Hiromi. 2008. *Daiichi daini gengo ni okeru Nihongo meishi shūshokusetsu no shūtoku katei* [The acquisition process of Japanese noun-modifying clauses by first and second language learners]. Tokyo: Kurosio Publishers.
- Ozeki, Hiromi and Yasuhiro Shirai. 2007a. Does the noun phrase accessibility hierarchy predict the difficulty order in the acquisition of Japanese relative clauses? *Studies in Second Language Acquisition* 29(2). 169–196.
- Ozeki, Hiromi and Yasuhiro Shirai. 2007b. The consequences of variation in the acquisition of relative clauses: An analysis of longitudinal production data from five Japanese children. In Yoshiko Matsumoto, David Y. Oshima, Orrin R. Robinson and Peter Sells (eds.), *Diversity in language: Perspectives and implications*, 243–270. Stanford, CA: CSLI Publications.
- Ozeki, Hiromi and Yasuhiro Shirai. 2010. Semantic bias in the acquisition of relative clauses in Japanese. *Journal of Child Language* 37(1). 197–215.
- Perdue, Clive (ed.). 1993. *Adult language acquisition: Cross-linguistic perspectives. Volume 1, Field methods*. Cambridge, UK: Cambridge University Press.
- Pienemann, Manfred. 1998. *Language processing and second language development: Processability theory*. Amsterdam: John Benjamins.
- Ragheb, Marwa and Markus Dickinson. 2011. Avoiding the comparative fallacy in the annotation of learner corpora. *Selected proceedings of the 2010 Second Language Research Forum: Re-considering SLA research, dimensions, and directions*. 114–124. Somerville, MA: Cascadia Proceedings Project.
- Rastelli, Stefano. 2009. Learner corpora without error tagging. *Linguistik Online* 38.
- Real, Florencia and Morten H. Christiansen. 2007. Processing of relative clauses is made easier by frequency of occurrence. *Journal of Memory and Language* 57(1). 1–23.
- Rutherford, William and Margaret Thomas. 2001. The child language data exchange system in research on second language acquisition. *Second Language Research* 17(2). 195–212.
- Sato, Charlene J. 1990. *The syntax of conversation in interlanguage development*. Tübingen: Gunter Narr Verlag.
- Schachter, Jacquelyn. 1974. An error in error analysis. *Language Learning* 27(2). 205–214.
- Schoonen, Rob, Amos van Gelderen, Reinoud D. Stoel, Jan Hulstijn and Kees de Glopper. 2011. Modeling the development of L1 and EFL writing proficiency of secondary school students. *Language Learning* 61(1). 31–79.
- Sheu, Shiah-pey. 2000. Shizen hatsuwa ni okeru Nihongo gakushūsha niyoru “teiru” no shūtoku kenkyū: OPI dēta no bunseki kekka kara [Acquisition study of -te iru in natural speech by Japanese learners: Based on an analysis of OPI data]. *Nihongo Kyōiku* [Journal of Japanese Language Teaching] 104. 20–29.

- Slobin, Dan I. 2011. Child language study and second language acquisition: Twenty years later. In Marzena Watorek, Sandra Benazzo and Maya Hickmann (eds.), *Comparative perspectives on language acquisition: A tribute to Clive Perdue*, 245–262. Bristol: Multilingual Matters.
- Springer, Suzanne and Laura Collins. 2008. Interacting inside and outside of the language classroom. *Language Teaching Research* 12(1). 39–60.
- Tono, Yukio, Tomoko Kaneko, Hitoshi Isahara, Tomomi Saiga, Emi Izumi, Masumi Narita and Emiko Kaneko. 2001. The Standard Speaking Test (SST) corpus: A 1 Million-word spoken corpus of Japanese learners of English and its implications for L2 lexicography. *Studies in Lexicography* 11. 7–17.
- Usami, Yo. 2006. “Taiyaku sakubun dētabēsu” sakusei no mokuteki to sono tayōna katsuyō ni tsuite [The purpose and various utilization of “Multilingual database: Essays and Translations by Learners of Japanese Language”]. In Kokuritu Kokugo Kenkyūjo (ed.), *Sakubun taiyaku dētabēsu no tayō na riyō no Tameni: “Nihongo kyōiku no tamenō gengoshigen oyobi gakushū naiyō ni kansuru chōsakenkyū” Seika hōkokusho* [For Various Use of Multilingual Database: Report for “Research on the Database and Contents of Education of Japanese Language Teaching”], 9–42. Tokyo, Kokuritsu Kokugo Kenkyūjo.
- van Compernelle, R. A., & Williams, L. 2009. Learner versus nonlearner patterns of stylistic variation in synchronous computer-mediated French. *Studies in Second Language Acquisition* 31(03). 471–500.
- Whitman, Randal L. and Kenneth L. Jackson. 1972. The unpredictability of contrastive analysis. *Language Learning* 22(1). 29–41.
- Zhang, Yanyin. 2004. Processing constraints, categorial analysis, and the second language acquisition of the Chinese adjective suffix -de(ADJ). *Language Learning* 54(3). 437–468.

V Clinical linguistics

Kiyoshi Otomo

13 Assessment of language development in children with hearing impairment and language disorders

1 Introduction

Spoken language can be thought of as consisting of three domains: speech, language, and communication. The speech domain concerns speech sound output, or more specifically, articulation, voice, prosody, and fluency. In the process of developing phonological skills, infants gradually refine their vocal output through initial reflexive vocalizations to approximate speech production in the linguistic environment. Children also learn to sequence speech sounds with adequate suprasegmental properties. Typical disorders in the speech domain thus include phonological disorders, voice disorders, and fluency disorders or stuttering.

The language domain, on the other hand, mainly encompasses the link between the phonological form and its meaning and the rules for combining words/morphemes to form sentences. Typically, children acquire their first words at around their first birthday or during their second year. Besides language-specific skills, language acquisition in children can depend on cognitive skills related to the conceptualization and symbolization of the events and objects in their environment. The hallmark of the acquisition of language is the mastery of the syntactic rules of the environmental language. Developmental delays involving a limited lexical repertoire and restricted grammatical proficiency are problems in the language dimension, and intellectual disabilities can affect language development.

The third aspect of verbal skills concerns interpersonal communication. We use language to convey our needs and offer information to listeners. The process of joint engagement between children and others in their environment constitutes a basis for early expressive and receptive language development (Adamson et al. 2009). In fact, optimal parental responses to children's attempts at communication have been found to be associated with the onset of spoken language in both typically developing children and those with intellectual disabilities (Yoder and Warren 2004). At the conversational level, proficiency in dyadic communication includes initiating and maintaining conversational topics and requesting and providing clarification, which require skills in social inferencing. Children with autism spectrum disorders have particular difficulty in this domain of social communication.

The developmental processes in children with various deficiencies in hearing or in intellectual and socio-cognitive functioning shed light on the impact of sensory and cognitive factors on the acquisition of spoken language. This chapter first offers

key findings related to the developmental process, focusing mostly on the language domain in hearing-impaired children learning Japanese. The chapter also describes assessment methods to capture the characteristics of language skills of children with various conditions that cause difficulties in language acquisition. In this context, the chapter introduces major findings on verbal development in children with intellectual disabilities, autism spectrum disorders, specific language impairments, and developmental risks associated with low birth weight.

2 Language development in hearing-impaired children

2.1 The nature of hearing impairment

In acquiring language, children rely heavily on auditory input. They also use auditory feedback from their own speech to adjust their output to match the target sounds. Thus, hearing impairment not only deprives children of verbal input but also breaks the association between environmental speech sounds and the creation of a phonological representation. Even if children with a hearing impairment or deafness have access to speech input, they must rely on frequency information that is insufficient and distorted due to the characteristics of residual hearing or of the output of devices worn to compensate for the hearing loss.

Hearing impairments can be characterized by both degree and type, i.e., conductive, sensorineural, or mixed. The most common cause of hearing loss in children is otitis media, or inflammation or infection of the middle ear. This condition results in a conductive loss because it interferes with the transmission of sound from the auditory canal to the inner ear, although the inner ear itself functions normally. Hearing loss due to otitis media is usually fluctuating and transient. In contrast, sensorineural losses result from dysfunctions in the inner ear. Sensorineural losses in childhood can be congenital or can result from injury, infection, or ototoxicity. Mixed losses involve both conductive and sensorineural mechanisms.

The hearing threshold is the lowest sound level at which a person can detect a sound at a given frequency. The severity of hearing impairment can be measured as the average threshold, in decibels (dB HL), an individual displays on pure tone testing at the frequencies of 500, 1000, and 2000 Hz, which are highly relevant to speech sound recognition. In mild hearing loss, the quietest sounds that children can hear with their better ear are between 26 and 40 dB HL. Children with moderate, moderately severe, and severe hearing loss have hearing thresholds of 41–55, 56–70, and 71–90 dB HL, respectively. Profound hearing loss refers to the inability to hear sounds below 91 dB HL (Clark 1981).

It is important to note that various factors other than the magnitude of hearing loss can affect language development. In addition to the severity and type of loss, language outcome may be affected by the age at which hearing loss occurs. Pre-lingual deafness refers to the complete loss of hearing due to an impairment that is congenital or acquired before the individual has mastered a language. This condition imparts greater disadvantages compared with postlingual deafness because the child is unable to access spoken language models from the outset. Other factors that affect language development include the age at which the hearing loss was identified, when and how hearing amplification devices were used, and the child's educational history. In Japan, children with hearing loss greater than about 60 dB HL in both ears who are unable to understand or who have significantly difficulty understanding ordinary speech even using hearing aids generally attend special schools for the deaf, where both oral speech and manual signing are used. Children with milder hearing impairments generally attend regular schools that emphasize the use of speech, capitalizing on residual hearing. In these settings, watching the speaker's lip movements, called lipreading, is often encouraged, and signing is not used as a main mode of communication. These factors lead to increased individual variation among the linguistic skills of hearing-impaired children.

2.2 Phonological and lexical development in hearing-impaired children

Studies on the initial stages of speech development in hearing-impaired infants showed that both deaf and normally hearing infants produce non-speech-like vocalizations such as raspberries, squeals, and growls (Oller, Eilers, Bull, and Carney 1985; Stoel-Gammon and Otomo 1986). Children with normal hearing typically pass through stages, beginning with the production of mostly vowel-like sounds, then moving to a gradual increase in the production of consonant-like sounds and immature syllabic forms, and finally producing well-formed syllables with true consonants, a stage called canonical babbling (Oller 1980). However, well-formed canonical syllables are greatly reduced or delayed in deaf infants (Eilers and Oller 1994; Oller et al. 1985). In terms of the segmental aspect of production, the size of the consonantal inventory has been reported to be smaller in hearing-impaired infants (Stoel-Gammon 1988; Stoel-Gammon and Otomo 1986). Furthermore, the number of consonant types appeared to remain constants or decrease over time among hearing-impaired infants aged 4–28 months, which contrasted with the expanding repertoire observed in normally hearing infants aged 4–18 months (Stoel-Gammon and Otomo 1986).

Children typically begin to communicate verbally around their first birthday, and they acquire a full repertoire of phonological constituents during their first few years. One of the prominent characteristics of the speech of children with hearing

impairments is low intelligibility (e.g., Yoshinaga-Itano 1998). Some profoundly deaf children may develop intelligible speech, but the speech of profoundly deaf children is often very difficult to understand.

Besides the problems of articulatory precision, hearing-impaired children are also limited by a relatively small vocabulary size and spoken language morphology and syntax. Large individual differences are observed in the onset of first words among Japanese-learning children with profound hearing impairment, ranging from one to about three years (Hirota 1993). The subsequent development of language skills is delayed, but the order of language development milestones is reportedly similar to that in normally hearing children, such as the onset of two-word combinations, the acquisition of *wh*-words (*nani* 'what', *dare* 'who', *doko* 'where'), and the production of sentences including relative clauses.

More detailed investigations show some unique characteristics in the vocabulary development of hearing-impaired children. Sato and Yokkaichi (2004) examined the use of verbs in elementary school children with moderate hearing impairments and normally hearing children matched for age using cloze tasks that required children to insert missing verbs in sentences. Verbs were classified into general verbs and specific verbs based on the range of meaning and the applicability to the context. General verbs (e.g., *tukuru* 'make') could be used for a general purpose, as in *Ie o **tukuru** 'make' a house* and *Keeki o **tukuru** 'make' a cake*, whereas specific verbs (e.g., *tateru* 'build' and *yaku* 'bake') could be used for specific purposes, as in *Ie o **tateru** 'build' a house* and *Keeki o **yaku** 'bake' a cake*. Hearing-impaired children tend to use general verbs to a greater extent than do normally hearing children. According to Sato and Yokkaichi, a greater number of 3rd and 4th grade normally hearing children used the specific verb *sosogu* 'pour' than used the general verb *ireru* 'put in' in a cloze task such as *Zyuusu o () () juice*, whereas the majority of hearing-impaired children in the same age range used *ireru* 'put in' in the same context. Furthermore, the ratio of specific verbs to general verbs steadily rose with age in normally hearing children, but no similar steady increase was found in hearing-impaired children. These findings suggested that the co-occurrences of nouns and verbs were relatively fixed, leading to the undifferentiated use of general verbs across contexts in hearing-impaired children.

Sato, Aizawa, and Yokkaichi (2012) examined verb use among students with more severe hearing impairments who were attending schools for the deaf. The use of specific verbs by students in higher grades of the junior high division at the school for the deaf was found to be comparable to that in normally hearing children in the middle grades of elementary school. Furthermore, although there was no significant relationship between the students' scores for general verbs and scores on a reading test, specific verb scores were found to be correlated with reading scores. Thus, hearing-impaired children generally have a smaller verb repertoire, reflecting their insufficient linguistic input and verbal experience, but their basic vocabulary expands through experience and written texts.

2.3 Syntactic development in hearing-impaired children

Japanese verbs take a variety of inflectional suffixes, and appropriate ending forms can create a wide range of meanings. Verbs followed by *-teageru* and *-temorau* have connotations of giving and receiving some kind of action as a favor, respectively, as in (1). These semantic variations may be discussed in the context of morpho-syntax because they express relationships between the person performing the action and the one who receives the action. Deaf children have been shown to have particular difficulty in the comprehension of sentences including these forms.

- (1) a. *Otoosan wa kodomo ni hon o katteageta.*
 father TOP child DAT book ACC buy.gave
 'The father bought a book to the child.'
- b. *Taroo wa otoosan ni syukudai o osietemoratta*
 Taroo TOP father DAT homework ACC teach.received
 'Taro was helped by her father on the homework.'

The comprehension of these types of sentences by students aged 12 to 17 years in a school for the deaf was found to be similar to that of first to third grade primary school children with normal hearing (Agatsuma, Sugawara, and Imai 1980). Comprehension of sentences using the passive voice was shown to be even more difficult. The average comprehension of such sentences as (2) in upper high school-level deaf students did not reach that of early elementary level hearing children.

- (2) *Usagi ga zoo ni oikakerareru.*
 rabbit NOM elephant DAT chase.passive
 'The rabbit is chased by the elephant.'

The pace of development is not the only factor that shapes grammar acquisition. Sentences produced by hearing-impaired children are not only grammatically simple but also often include grammatical errors. Deaf children typically exhibit frequent errors in the use of case particles such as the nominative *-ga*, the accusative *-o*, the genitive *-no*, and the dative *-ni*, suggesting that these forms have not been adequately differentiated. Such errors as (3a), (4a), (5a), and (6a), which should be (3b), (4b), (5b), and (6b), respectively, are abundant in the writings of children in schools for the deaf (Agatsuma 1983).

- (3) a. **Senro ga tukurimasita.*
 railway NOM made
- b. *Senro o tukurimasita.*
 railway ACC made
 '(He) made the railway.'

- (4) a. **Boku wa densya o asonda.*
 I TOP train ACC played
 b. *Boku wa densya de asonda.*
 I TOP train with played
 ‘I played with a train.’
- (5) a. **Densya no asobimasyoo.*
 train GEN play.let’s
 b. *Densya de asobimasyoo.*
 train with play.let’s
 ‘Let’s play with a train’.
- (6) a. **Otoosan o kattemoratta.*
 father ACC buy.received
 b. *Otoosan ni kattemoratta.*
 father DAT buy.received
 ‘My father bought (it) to me.’

In the writings of deaf elementary 5th and 6th graders, nearly 80% of errors in case markers focused on the subject marker *-ga* and the direct object marker *-o* (Sawa 2000). Most errors related to these case particles involved interchange among *-ga*, *-o*, and *-ni*, which is consistent with the results of other studies (Ito 1988; Kim and Ito 2008; Sawa 2010; Sawa and Aizawa 1998). The concept of deep cases has been employed to account for these error patterns. Sawa (2010) reported that most errors in case markers in the writings of junior high school students in schools for the deaf concerned the use of *-ga*, *-o*, *-ni*, and *-de* and further demonstrated that substitution errors tended to occur among case particles representing the same deep case. For example, the objective case, which is typically indicated by *-o*, can also be indicated by *-ga* and *-ni*, depending on the verb in a sentence. Consistently, the objective use of *-ga* was likely to be replaced by either *-o* or *-ni*, as in (7), and *-o* by either *-ni* or *-ga*, as in (8). On the other hand, the low error rates for *-kara*, *-made*, and *-yori* may be explained by the relatively limited deep case functions assigned to these particles, as well as their low frequency of occurrence. Some have attempted to explain the phenomenon in which certain case particles are more likely to be substituted than others by invoking structural and inherent cases in universal grammar. Kim and Ito (2008) argue that errors are more abundant among structural case particles, such as *-ga* and *-o*, that represent grammatical cases with no inherent meaning than among inherent case particles, such as *-ni* and *-kara*, that are associated with more specific meanings.

- (7) a. *Yama o mieru.
 b. Yama ga mieru.
 mountain ACC see.possible
 ‘(I can) see the mountain.’
- (8) a. *Aisu ni taberu.
 b. Aisu o taberu.
 icecream ACC eat
 ‘(I) eat icecream.’

Some other experimental studies have demonstrated sentence-processing difficulties in hearing-impaired children. In a study by Aizawa and Yoshino (1999), hearing-impaired adolescent students were visually presented with grammatical sentence stimuli (e.g., *Taroo ga gakkoo ni iru* ‘Taro is in the school’) or ungrammatical sentence stimuli (e.g., **Tegami ga ie o todoku*, which should be *Tegami ga ie ni todoku* ‘A letter is delivered to the house’) and asked to identify the grammatically correct phrase. The reaction times for this task showed that while the accuracies of judgment were similar between students with hearing impairment and normally hearing students, the hearing-impaired group took longer to respond, suggesting their comparatively inefficient syntactic processing. In another related study (Aizawa and Yoshino 2002), children judged the grammatical adequacy of case markers in stimuli such as *Himo o tukamu* ‘Catch a rope’ (correct) and **Himo ni tukamu* (incorrect) and the semantic adequacy in stimuli such as *Himo o tukamu* ‘Catch a rope’ (correct) and **Omise o tukamu* ‘Catch a store’ (incorrect). Children with hearing impairment showed longer reaction times only for the adequacy judgment of case markers, suggesting that semantic information inherent in the vocabulary was used more efficiently in sentence processing than were case markers.

The abundance of errors in case markers in Japanese-speaking hearing-impaired children appears to be consistent with the findings obtained from English-speaking hearing-impaired children. Children with moderate hearing impairment exhibit errors in grammatical markers in developing morphology (McGuickian and Henry 2007). For example, hearing-impaired children aged about 7 years showed significantly more errors in the production of plural *-s* and possessive *-s* than did normally hearing children aged about 3 years. While irregular past forms and the progressive *-ing* were produced more accurately by the hearing-impaired children, suggesting that perceptual saliency affects the mastery of certain grammatical morphemes, other factors such as syntactic categories, semantics, and the frequency of grammatical morphemes in input also determine the patterns of acquisition in hearing-impaired children (McGuickian and Henry 2007). Unlike English, Japanese case markers are all syllabic, making them more detectable in hearing loss. Nevertheless, reduced quality of input would hinder efficient generalization of the functions of case

markers, precluding the establishment of grammatical rules in hearing-impaired children. Taken together, previous studies have indicated that the syntactic learning of hearing-impaired children is affected by such factors as the input quality and detectability of the morphemes to be learned, the semantic complexity defined by the relationship between a case particle and a verb, the range of case functions of the case particle to be learned, and the frequency of experience of the syntactic structure.

2.4 Comprehension of metaphors in hearing-impaired children

Besides vocabulary and skills related to syntax, comprehension and expression of more indirect forms of language such as metaphors and euphemisms also contribute to a child's overall verbal skills. Sentences (9a) and (9b) are examples containing a perceptual metaphor and a conceptual metaphor, respectively.

- (9) a. *Kumo wa watagasi desu.*
 cloud TOP cotton candy COP
 'A cloud is cotton candy.'
- b. *Raion wa oosama desu.*
 lion TOP king COP
 'A lion is a king.'

Comprehension of metaphors may be tested by asking a child to select the sentence that best matches the meaning of a given metaphoric sentence. For example, a sentence 'A cloud is white and soft' is the expected answer for sentence (9a). When students with severe to profound hearing impairments who were attending schools for the deaf were tested using the metaphor method, 4th graders comprehended erroneously over half of the sentences containing metaphors (Sawa and Yoshino 1994). Errors included the selection of choices that described the sentence topic, 'a cloud' in (9a), such as 'A cloud floats in the sky,' and choices that described the metaphoric vehicle, 'cotton candy,' such as 'A cloud is sweet and tasty.' Comprehension of conceptual metaphors such as (9b) was found to be even more difficult, and the average accuracy did not improve until high school age. While individual differences do exist, hearing-impaired children appear to have difficulty constructing a network of concepts about the world due to their limited language experience.

2.5 Initial stage of sign language development

Although sign language is a natural language in the community of deaf people, the amount of exposure to and experience with sign language greatly differs from one

child to another. A majority of deaf children are born to hearing parents who do not know sign language and many parents are not even immediately aware of their child's hearing impairment. Under such conditions, their early language and communication opportunities via either oral language or signing will be extremely limited, with a consequential delay in language proficiency. Thus, the development of signing is best examined in hearing-impaired children born to deaf parents.

Takei and Torigoe (2000) used longitudinal observations to analyze hand activities in two deaf infants interacting with their deaf mothers in relation to their first use of Japanese Sign Language. The infants' hand movements were simple at around 6 months of age, but changed to rhythmic and repetitive movements at around 10 months. At this point, their nonreferential gestures became more complex but they were initially meaningless signed words. This observation indicated continuity between the hand shapes and movements involved in nonreferential gestures and those used in first signs. Nonreferential gestures were suggested to be the manual analogy of vocal babbling, consistent with findings from deaf children raised with American Sign Language (Petitto and Marentette 1991).

Gestures appeared to function as precursors to the formation of signed two-word combinations as well (Takei and Torigoe 2001). Analysis of the early period of sign development revealed that the sequential signing of two words was preceded by the production of a single word sign accompanied by pointing. Longitudinal observations of three deaf children of signing parents showed that all children began to use two-word combinations, such as pointing + a noun-like sign as in 'That is a dog', and pointing + a verb-like sign as in 'He is cooking', with a pointing gesture mostly occupying the beginning of the sentence (Torigoe and Takei 2001). In the next stage, a redundant pointing gesture or a sign began to be observed at the end of three-word sentence, such as pointing + FISH + pointing 'This is fish', pointing + TOGETHER + pointing 'You do it with [me]', and DRINK + pointing + DRINK '[I] drink this'. Redundant pointing gestures occurred frequently, suggesting that the patterned redundancy played a rudimentary grammatical role in organizing the sentence. However, studies of grammatical development in Japanese Sign Language are limited to only a few case reports, and further research is needed.

3 Characteristics of language in children exhibiting atypical development

As with studies of children with hearing impairment, language skills in special populations can be examined by analyzing spontaneous speech and administering language-specific tasks. This section overviews the characteristics of language in children exhibiting atypical development. We will first introduce findings related to

intellectual disabilities and autism spectrum disorders (ASD), followed by findings from children with low birth weight and those with specific language impairment (SLI).

3.1 Vocabularies of children with intellectual disabilities and children with autism spectrum disorders

Individuals with intellectual disabilities may exhibit a pattern of cognitive development similar to typically developing children, but with a slower developmental trajectory (Owens 2009). Facon, Facon-Bollengeir, and Grubar (2002) concluded that the cognitive level contributes more to these children's syntactic skills than to their vocabulary size. Based on the finding that the inclusion of chronological age in the analysis improved the predictability of receptive vocabulary scores, they suggested that age-related experience is linked to the receptive vocabulary of children and adolescents with intellectual disabilities.

ASD is another major type of developmental disability, and according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), ASD is characterized by deficits in social communication and social interaction, including difficulties in social-emotional reciprocity, nonverbal communicative behaviors, and developing and maintaining interpersonal relationships. Children with ASD also exhibit restricted, repetitive patterns of behavior, interests, and activities. Children at one end of the autism spectrum may be nonverbal, whereas those at the other end of the continuum may have age-appropriate vocabulary and syntactic skills. Even verbal children may exhibit particular deficits in pragmatics.

In assessing a child's lexical repertoire, a questionnaire may be administered to the child's parents or caregiver that includes questions regarding the child's vocabulary. This method has an advantage over direct testing with a child in that the child's daily communicative behaviors can be reflected in the scoring. The Japanese MacArthur Communicative Development Inventories (Ogura and Watamaki 2004; Watamaki and Ogura 2004) is an example of a standardized checklist that yields scores convertible to a developmental age or index. Non-standardized vocabulary checklists can also assess the vocabulary of children with limited expressive language, such as children with intellectual disabilities and ASD.

Lexical acquisition and subsequent growth of expressive vocabulary are delayed in children with intellectual disabilities and in those with autism (Kjelgaard and Tager-Flusberg 2001; Loucas et al. 2008). Rescorla and Safyer (2013) suggested that the lexical development in children with ASD was delayed but not deviant, reporting that neither the semantic nor the word-class categories of children with ASD differed from those of the normative sample when the two groups of children were matched for vocabulary size. Inspection of their data, however, seems to show that some

individual words were acquired earlier by children with ASD than by typically developing children and that the reverse was true for some other words. Possible group differences have also been suggested by Fujiue and Otomo (2009), who examined the early Japanese vocabularies of school-age children with intellectual disabilities and those with autism using a 291-word vocabulary checklist completed by parents of children with autism and children with intellectual disabilities aged 5;1 to 12;7. Their data were reanalyzed by selecting 12 children with ASD (mean age: 8;11) and eight children with intellectual disabilities (mean age: 8;7) with vocabularies of 90–250 words. The developmental ages (DAs) of these groups of children, expressed as the average equivalent age of typically developing children who are performing comparably to a particular child in the social, communicative, motor, and self-help domains, were also comparable, with mean DAs of 3;3 for the ASD group and 2;11 for the group with intellectual disabilities. When the mean percentage of children who acquired each word was calculated, more than 40% more children with intellectual disabilities than with ASD had acquired *oide* ‘come here’, *kuru* ‘come’, *un* ‘yes’, and *kawaii* ‘cute’. In contrast, more than 40% more children with ASD than with intellectual disabilities had acquired *naku* ‘cry’, *ari* ‘ant’, *korobu* ‘fall down’, *nezumi* ‘mouse’, and *warau* ‘laugh’. Thus, words for conversational and interpersonal use as well as words used to share interests with others seem to be more common in the expressive vocabularies of children with intellectual disabilities. Although this conclusion requires confirmation with a larger group of children, it seems likely that the socio-emotional cognitive deficits of children with ASD may cause the lexical bias observed in this study.

3.2 Vocabulary in children with high-functioning autism spectrum disorders

ASD encompasses a wide intellectual range, and children with ASD may have intellectual functioning comparable to typically developing children. Whether any discrepancy exists in the vocabulary of ASD children in light of typical development should be examined by investigating the word productions of ASD children without intellectual disabilities or children with high-functioning ASD (HFASD).

To investigate the knowledge of verbs, Tatsumi and Otomo (2009) examined the expression and comprehension of seven action words, such as *nageru* ‘throw’ and *korogasu* ‘roll’, in 35 children with HFASD and 25 typically developing (TD) children between 3 and 5 years of age, who were matched according to the mental ages, assessed using intelligence tests for the HFASD children and chronological ages for the typically developing children. When children were requested to describe pictures illustrating one of seven actions with a verb, the number of correct responses was not significantly different between the groups. However, HFASD children tended

to produce verbs that were less appropriate. For example, nearly half the HFASD children described a picture of a boy breaking a stick with his hands using inappropriate verbs such as *yabui teru* 'tearing', *kitteru* 'cutting', and *tatai teru* 'hitting'. HFASD children also used significantly more intransitive verbs to describe the boy's action in the picture. For example, some HFASD children answered *ware teru* '[The stick is] being cracked' and *yabure ru* '[The stick is] being torn' rather than using a transitive verb *otteru* '[The boy is] breaking' for the picture of a boy breaking a stick. Another example was a picture of a boy lining up dolls, for which the children used the intransitive form *naranderu* '[Dolls are] lining up' rather than the transitive *narabeteru* '[The boy is] lining up [dolls]'. This contrasted with TD children who used intransitive verbs much less frequently. The use of intransitive verbs appears to reflect the HFASD children's tendency to focus on objects rather than persons, as the interest of individuals with ASD is generally focused on parts of objects. Thus, their vocabulary use may be linked to their unique style of cognitive processing.

Another characteristic common to individuals with ASD is difficulty in understanding others' emotional states and expressing mental states (Losh and Capps 2006; Tager-Flusberg 1992). Some studies have focused on mental verbs such as 'know', 'forget', 'think', and 'believe'. For example, a study conducted by Dennis, Lazenby, and Lockyer (2001) demonstrated that, compared with typically developing children, children with HFASD had greater difficulty understanding that the sentence 'She remembered to shut the door' was linked to the action of shutting the door, whereas the sentence 'She wants to shut the door' does not imply that the action has been completed.

Sakai, Tatsumi, and Otomo (2014) investigated the comprehension of words that express mental states of the self and others in Japanese-speaking 1st to 5th grade school children with HFASD. The words included verbs, such as *komaru* 'perplexed' and *hagemasu* 'encourage', adjectives such as *kuyasii* 'regrettable' and *uresii* 'happy', and onomatopoeias, such as *waku-waku*, *hara-hara*, and *ira-ira*, which express uneasiness due to pleasant expectations, uneasiness due to expectations of danger, and mild anger, respectively. In the definition task, in which a child selected the definition of a given word from three choices, the HFASD children as a group scored significantly lower than did the typically developing children. In another task, children were given a verbal description of a situation, such as 'I am going on a field trip that I have longed for', followed by the context *Watasi wa () siteimasu*. 'I am ()'. The HFASD children had also greater difficulty than their typically developing peers in selecting the appropriate word, *waku-waku* in this case, from among the three words. The results agreed with previous findings showing that HFASD children's difficulty with insights into internal state hinders the acquisition of words related to mental states. Emotion-evoking situations are not as firmly associated with verbal expressions in HFASD children as in their peers, demonstrating that cognitive functioning affects lexical learning in a triad of words, emotional states, and the situation.

3.3 Analysis of spontaneous speech samples of low-birth-weight children

In English, grammatical development in spontaneous expressive language is often estimated using the mean length of utterance (MLU) (Brown 1973). MLU counts the number of morphemes included in a speech sample. Although MLU is a widely used measure of language development in English speakers, it has not yet been standardized for Japanese. One factor that hinders MLU analysis from becoming widely accepted is the lack of consensus in estimating the length of utterance in Japanese. There are a number of different proposals regarding the division of words into morphemes using this measure. For example, *miteru* 'looking' may be analyzed as comprising two morphemes (*mi-teru*) or three morphemes (*mi-te-[i]ru*). Defining their own procedures, some researchers have used the MLU to capture developmental trends in typically developing Japanese children (Ogura et al. 1997).

One study examined the expressive language of low-birth-weight (LBW) Japanese children using MLU (Otomo, Wakaba, and Nara 1998). LBW children have been reported to have higher risks of language and cognitive delays (Barre et al. 2011; Taylor, Hack, Klein, and Schatschneider 1995), although environmental factors, e.g., the richness in caregivers' verbal input accompanying gestures, also contribute to later language and cognitive development (Lee and Barratt 1993; Schmidt and Lawson 2002). Language skills of extremely LBW children (<1,000 g) were compared with those of normal birth-weight children at 5 years of age. Speech samples obtained in a free-play setting and during a sequential picture description task were analyzed for MLU in morphemes (MLUm) and the mean number of *jiritsugo*, or independent (freestanding) words, such as nouns, verbs, adjectives, adverbs, and conjunctives, per sentence (JMLU). The validity of MLU is generally restricted to early developmental stages. For English, Brown (1973) noted that the index is reliable up to an MLU of about 4.0; beyond this, it probably depends more on the type of interaction than on the extent of the child's grammatical knowledge. According to Scarborough, Wyckoff, and Davidson (1986), the relationship between MLU and age is linear for children up to 4 years, beyond which it becomes nonlinear. Although the applicability of MLU in relation to age has not been examined for Japanese, the acquisition of a conjunctive particle would presumably change the nature of the relationship between the index and the child's grammatical ability. In describing sequential pictures, in particular, children tended to combine multiple main clauses with a conjunctive particle *-te*, such as *Oyatu o tabete, utini kaette, neta no* '[I] ate a snack, went back home, and went to bed'. Because the subjects' frequent use of main clause coordination makes the MLU less appropriate, utterances obtained in the picture-description task were analyzed within each T-unit, or minimally terminable unit, which is defined as the shortest grammatically allowable sentence (Hunt 1965). In the example above, the sentence can be divided into three T-units. The results showed that mean scores on a standardized language test and MLUm and

JMLU values were all lower for low birth-weight children compared with their normal birth-weight peers. Furthermore, these indices of syntactic complexity were correlated with the language test scores, suggesting that speech sample analysis is a valuable means of evaluating a child's productive language skills.

3.4 Language development in children with specific language impairments

A condition of a more restricted deficit in language compared with the overall level of intellectual functioning is often called a specific language impairment (SLI). SLI has been characterized as a neurodevelopmental disorder in the normal course of language development in the absence of hearing impairment or general cognitive deficit, such as intellectual disability, autism, or any other obvious neurological, psychological, or physiological disorder (Leonard 1998). The understanding of SLI has been complicated by the diversity of presentations that researchers consider linguistic manifestations of SLI. The findings of past studies showed that children with SLI comprise a heterogeneous group, and deficits are not always confined to the language domain. There are two broad, opposing views of SLI. Some researchers speculate that deficits originating from inefficient speech information processing are due to limited cognitive functioning. Such cognitive explanations include auditory processing deficits (Leonard, McGregor, and Allen 1992) and limitations in general processing speed (Kail 1994; Miller et al. 2001). Others view SLIs as grammatical deficits, such as the inability to acquire certain grammatical properties that govern inflectional morphology. For instance, children often omit grammatical morphemes, such as the verb tense *-ed*, agreement in number, and subject-verb agreement in obligatory contexts (Rice, Wexler, and Cleave 1995). Some argue for the presence of a sub-group of SLI, grammatical-SLI, and claim that domain-specific systems are impaired (van der Lely 2005).

Japanese is a pro-drop language that allows null arguments in finite clauses, and case particles can often be omitted in conversational speech. This contrasts with English, which has an abundance of obligatory contexts for verb tense, third person singular, and the copula form of the verb *be*, where persistent errors in children can be a sensitive indicator of language impairment. Furthermore, because a verb stem is always accompanied by an inflectional morpheme, inflectional affixes cannot be omitted in Japanese, whereas their deletion is often raised as evidence of SLI in English (Rice, Wexler, and Cleave 1995). Thus, one reason for the paucity of studies on SLI for Japanese is that grammatical deficits are less identifiable in conversational speech. Another reason for the limited number of SLI studies is the dearth of standardized language assessment tools for Japanese. In many English SLI studies, a discrepancy between verbal and non-verbal scores on standardized language and intelligence tests constitutes evidence of SLI. In contrast, the lack

of reliable language ability indices to compare with non-verbal cognitive abilities hinders the clarification of characteristics of SLI in Japanese speaking children.

3.4.1 Language Characteristics in Specific Language Impairment (SLI) in Japanese: Analysis of the Speech of Twins with Difficulties in Syntax

Otomo (2004) analyzed the speech of 6-year-old fraternal twin sisters who exhibited unique syntactic errors. Their difficulties in language and contrasting above-average non-verbal intelligence test scores (performance IQ of 109 for both children) indicated selective difficulties in language-related areas. The twins were born in the US but were raised speaking Japanese in the family. They both began to produce meaningful speech very late, at 2 years 6 months of age. When they came to Japan at age 4, much of their speech was so unintelligible that it could only be understood by their parents. Their unique and persistent difficulties in syntax, in particular, suggested that SLI, rather than their linguistic environment in early childhood alone, caused their language difficulties. Spontaneous speech analysis revealed some error patterns, including the addition of case particle *-no* in noun phrases (e.g., **tiisai no sakana* for *tiisai sakana* ‘small fish’) and errors in verb morphemes (e.g., **syabe-rareru* for *syabe-reru* ‘can talk’). They also exhibited incorrect application of grammatical morphemes. The conjunctive particle *kara* and *kedo* follow a verb or adjective, as in *tukuru-kara* ‘because [I] make’ or *yasasii-kedo* ‘although [it is] easy’. On the other hand, a noun is followed by a combination of the copula *da* and the conjunctive particle *kara* or *kedo*, as in *ame da-kara* ‘because of rain’ and *yoru da-kedo* ‘although [it is] night’. Both children applied the latter forms to verbs or adjectives, such as **tukuru dakara*, and **yasasii dakedo*, exhibiting error patterns which are on the surface common to errors made by some Japanese-as-a-Foreign-Language (JFL)/Japanese-as-a-Second-Language (JSL) learners. These children may not have been aware of the rules governing the combination of a stem and a copula. It is also possible that they created their own rule of attaching a conjunction *dakara* ‘therefore’ or *dakedo* ‘but’ to a verb or an adjective, whereas conjunctions should properly be placed at the beginning of a sentence. Sentence production was further examined in an imitation task, which consisted of simple and complex sentences of varying degrees of syntactic complexity. Results of this task showed inaccuracies in reproducing sentences, particularly verb phrases and case particles, and the girls’ overall scores were lower than those of typical 6-year-old children. In another imitation task, in which the syntactic structures that caused errors in their spontaneous speech were specifically explored, syntactic errors were not generally present when the proper models were provided for them to imitate. However, the children still demonstrated difficulties with certain structures, such as **samui dakara* ‘because [I am] cold’ and **syabe-rareru*, which should be *syabe-reru* ‘can talk’, even under a correct model. Overall, the results of the imitation tasks suggested difficulties in processing language and in learning the appropriate syntactic rules. While these

error patterns may reflect their insufficient exposure to Japanese and they may not be typical of Japanese-speaking SLI children, the findings suggested that this group of children has difficulties in acquiring morpho-syntactic rules.

3.4.2 Syntactic Characteristics in SLI in Japanese

Fukuda and Fukuda (2001) focused on the generation of morphologically complex predicates and conducted an elicited production task with children who were judged to have SLI. Passive and causative predicates can be formed by suffixing the productive passive morpheme *-rare-* and the productive causative morpheme *-sase-* to the stem as in (10b) and (10d), respectively. Children with SLI were given pictures that described the meaning of a sentence and asked to complete sentences that lacked suffixes with appropriate complex predicates. The SLI children exhibited selective difficulty in forming morphologically complex predicates with the passive morpheme *-rare-* and the productive causative morpheme *-sase-*, which are generated outside the domain of the lexicon. On the other hand, the performance of the SLI children was no different from that of typically developing children for lexical causative verbs and lexical inchoative verbs formed within the domain of the lexicon. A lexical inchoative verb *tomar-u* 'stop' is derived by suffixing the inchoative morpheme *-ar-* to the verb root, and has the construct of stop.INCH-NONPAST as shown in (11a). A consonant-final verb stem *tomar* can be combined with a consonant-initial auxiliary such as *nai* or *masu* with a vowel linking them as in *tomar-a-nai* stop.INCH-NEG and *tomar-i-masu* stop.INCH-POLITE. A lexical causative verb *tome-ru* 'make [something] to stop' is derived by suffixing the causative morpheme *-e-* to the root, stop.CAUS-NONPAST (11b). A verb-final verb stem *tome* is combined with a particle as in *tome-nai* stop.CAUS-NEG and *tome-masu* stop.CAUSE-POLITE. Fukuda and Fukuda (2001) concluded that SLI affects the ability to construct productive morphological rules above the lexical domain.

- (10) a. *Inu ga neko o oikake-ru.*
 Dog NOM cat ACC chase-NONPAST
 'The dog chases the cat.'
- b. *Neko ga inu ni oikake-rare-ru.*
 CAT NOM dog DAT chase-PASS-NONPAST
 'The cat is chased by the dog.'
- c. *Seito ga hasir-u.*
 Student NOM run-NONPAST
 'The student runs.'
- d. *Sensei ga seito o hasir-ase-ru.*
 Teacher NOM student ACC run-CAUS-NONPAST
 'The teacher makes the student run.'

- (11) a. *Kuruma ga tomar-u.*
 Car NOM stop.INCH-NONPAST
 'The car stopped.'
- b. *Keikan ga kuruma o tome-ru.*
 Policeman NOM car ACC stop.CAUS-NONPAST
 'The policeman stops the car.'

Grammatical impairment of case assignment in Japanese children with SLI has also been demonstrated (Fukuda et al. 2007). In a sentence-completion task that required children to fill in missing case particles, the SLI children produced more errors than did the typically developing children in the case assignment of the nominative *-ga*, accusative *-o*, and dative *-ni*. Fukuda et al. (2007) also showed that the difficulties of the SLI children were more marked with scrambled sentences as in (12b) than with sentences using basic word order as in (12a). Based on the observation that many errors reflected the children's reliance on the surface word order in the assignment of case particles, they suggested that SLI children employed compensatory strategies supported by declarative memory. The recent proposal that SLI reflects a dysfunction of brain structures comprising the procedural memory system (Ullman and Pierpont 2005) can be applicable to the grammatical difficulties manifested by Japanese SLI children. The aforementioned unimpaired lexical-level operations for forming lexical causative and lexical inchoative verbs can be understood as employing declarative memory, as seen in the learning of the irregular inflection of English verbs such as *go* and *went*. More in-depth analysis of syntactic abilities is needed, and research from a broader cognitive perspective may lead us to a better understanding of SLI in Japanese children.

- (12) a. *Otokonoko ga onnanoko o osita.*
 Boy NOM girl ACC pushed
 'A boy pushed a girl.'
- b. *Onnanoko o otokonoko ga osita.*
 Girl ACC boy NOM pushed
 lit. 'A girl, a boy pushed.'

In another study (Tanaka Welty, Watanabe, and Menn 2002), the use of case particles and verb morphology was compared among SLI children, typically developing younger children matched for MLU in morphemes, and children matched for chronological age. After the experimenter presented a sentence model with a picture, the child was asked to describe the other pictures with the same syntactic structure with different subjects and objects. The subjects' syntactic structures were analyzed for accuracies of verb inflections for active, passive, and causative sentences,

and for accuracies of case particles. The SLI children's use of both case particles and verb morphology was less accurate than was that of their age-matched peers. Compared with their MLU-matched counterparts, however, the SLI children showed greater difficulty only with verb morphology, and they were comparatively accurate in their use of case particles. Tanaka, Welty, Watanabe, and Menn (2002) suggested that children with SLI have a general processing deficit and that the overload condition created by the task demands resulted in their morphological errors. The consideration of task demands is important because most SLI studies employ production tasks that require parallel processing of visual, auditory, and linguistic skills.

Another, more basic consideration necessary in discussing the results of SLI studies is subject selection. Both Fukuda and Fukuda (2001) and Tanaka, Welty, Watanabe, and Menn (2002) selected SLI children from among children with performance or a non-verbal IQ of no lower than -1 SD (standard deviation) from the mean, along with other criteria, such as normal hearing acuity and no evidence of neurological dysfunction. The term 'specific' language impairment can be misleading if a child with mild language impairment has a non-verbal intellectual level near the lowest margin of the 'normal' range. The degree of discrepancy between the verbal and non-verbal functioning levels is important, however. Studies on SLI should provide information on such discrepancies for each subject, as was done in the study by Fukuda et al. (2007). Only by considering the degree of discrepancy in subject selection criteria can language-specific skills be discussed independently of the influence of general cognitive processing.

4 Standardized tests of language for Japanese-speaking children

The assessment procedures mentioned above are used to investigate specific domains of language such as vocabulary and syntax by administering specific tasks and analyzing spontaneous speech. In clinical settings, however, a child suspected to have language development delay is more likely to be assessed using standardized language tests to clarify whether the delay truly exists and to what extent the child's development lags behind. Domain-specific standardized assessment tools are available for receptive vocabulary, such as the Japanese MacArthur Communicative Development Inventories and the Picture Vocabulary Test-Revised (Ueno, Nagoshi, and Konuki 2008), as is a standardized test of sentence comprehension, the Japanese Test for Comprehension of Syntax and Semantics (J.COSS) (J.COSS Kenkyukai 2010). Tests that examine productive syntax based on spontaneous speech and those that cover more than a single language domain can also be used to yield language profiles of strengths and weaknesses in children in special populations, information that is useful for selecting areas in which interventions may be beneficial. This

section describes a recently proposed procedure to analyze spontaneous speech and tools for comprehensive language assessment.

4.1 Developmental Sentence Score for Japanese (DSSJ)

MLU counts the number of morphemes included in speech samples, but it does not capture grammatical complexity in terms of early- or late-acquired morphemes. In the Developmental Sentence Score (DSS) (Lee 1974), words or morphemes in eight grammatical areas of spontaneous spoken English, such as noun modifiers, main verbs, and secondary verbs, are scored according to the relative age of acquisition. A morpho-syntactical measure for Japanese, the Developmental Sentence Score for Japanese (DSSJ) (Miyata et al. 2006), was developed based on the DSS model.

Considering the general order of acquisition of various grammatical skills in typically developing children, items that were acquired in relatively the same order were selected and classified into the following nine sub-areas:

1. Verb Final Inflection (e.g., *mi-ta* ‘see-**PAST**’)
2. Verb Middle Inflection (e.g., *mi-rare-ta* ‘see-**PASS-PAST**’)
3. Copula Inflection (e.g., *kirei datta* ‘was beautiful’)
4. Conjunctions and Conjunctive Particles (e.g., *nemui kara neru* ‘[I am] going to bed because [I am] sleepy’)
5. Noun Phrase Structure and Compounds (e.g., *hayai kuruma* ‘fast car’)
6. Case, Topic, Focus, and Quotative Particles (e.g., *Inu ga gohan o taberu* ‘The dog eats food’)
7. Adverbs (e.g., *motto taberu* ‘eat **more**’)
8. Sentence Modality Markers and Formal Nouns (e.g., *oisii-desu* ‘delicious-**POLITE**’)
9. Final Particles (e.g., *hasiru yo* ‘[It] runs, I tell you’ lit.)

Each of the items in these areas was assigned a point score; an item generally acquired early was given a low score, whereas an item appearing later scored up to 5 points. For example, the verb final inflection forms, nonpast (e.g., *taberu* ‘eat’), past (e.g., *tabeta* ‘ate’), and imperative *-te* (e.g., *tabete* ‘[I want you to] eat’) are assigned 1 point. The intensive *-yoo* (e.g., *tabeyoo* ‘[I am] going to eat’) and conjunctive *-te* (e.g., *tabete* ‘eat [and]’) are assigned 2 points. Thus, a sentence such as *Ii no katteageta yo* ‘[I] bought [him] something nice’ would receive a total of 10 points (1 point for adjective inflection *-i*; 3 points for the noun phrase construction adjective *ii* with the sentence nominalizing particle *no*; 4 points for the verb inflection *-teageru*; 1 point for the past tense *-ta*; and 1 point for the final particle *yo*).

Miyata et al. (2013) calculated DSSJ scores for 84 children divided into six age groups between 2;8 and 5;2 based on 100 sentence samples collected from spontaneous child–adult conversations. The analysis showed a steady increase in the DSSJ

Table 1: Examples of tasks in the vocabulary and syntax domains and the age levels at which the designated numbers of correct responses are expected by about half of the typically developing children according to LC scale.

Vocabulary	Examples of test items (number of items)	Number of items expected answered correctly by about half of children											
		Early 2-yrs	Late 2-yrs	Early 3-yrs	Late 3-yrs	Early 4-yrs	Late 4-yrs	Early 5-yrs	Late 5-yrs	Early 6-yrs	Late 6-yrs		
Comprehension of basic verbs	Point to a picture corresponding to a verb: <i>asobu</i> 'play', <i>tukuru</i> 'make', <i>suwaru</i> 'sit', <i>aruku</i> 'walk' (4)	2	3	4									
Comprehension of basic adjectives	Point to a picture corresponding to an adjective: <i>omoi</i> 'heavy', <i>hutoi</i> 'thick', <i>takai</i> 'high', <i>hayai</i> 'fast', <i>akarui</i> 'bright' (6)	3	4	5		6							
Production of locative words	Verbally describe the location of an animal: <i>ue</i> 'above', <i>sita</i> 'below', <i>yoko</i> 'beside' (3)			1	2	3							
Comprehension of wh-interrogatives	Answer questions on a short story: <i>Tabete</i> <i>itanowa doko desuka</i> . 'Where was he eating?' <i>Tabete itanowa dare desuka</i> . 'Who was eating?' (6)			4			5		6				
Production of antonyms	<i>katai</i> 'hard,' <i>hukai</i> 'deep,' <i>hiru</i> 'day,' <i>hurui</i> 'old,' <i>tooi</i> 'far' (5)								2-3				4

Table 1: (continued)

Syntax	Examples of test items (number of items)	Number of items expected answered correctly by about half of children											
		Early 2-yrs	Late 2-yrs	Early 3-yrs	Late 3-yrs	Early 4-yrs	Late 4-yrs	Early 5-yrs	Late 5-yrs	Early 6-yrs	Late 6-yrs		
		2	3		4								
Comprehension of two-word combinations	Point to a picture corresponding to a noun phrase: <i>sirōi neko</i> 'white cat', <i>suwatteiru otokonoko</i> 'sitting boy', <i>tabeteiru inu</i> 'eating dog' (4)												
Reproduction of sentences	Repeat sentences: <i>Osakana wa oyogimasu.</i> 'Fish is swimming', <i>Ringo o tabemasu.</i> '[I] eat an apple'. (4)		1	2	3								
Production of "color+noun" combinations	Verbally describe a picture: <i>aoi tori</i> 'blue bird', <i>kiroi tyoo</i> 'yellow butterfly' (2)			1									
Comprehension of case markers	Point to a picture corresponding to a sentence: <i>Inu ga oikaketeiru.</i> 'The dog is chasing', <i>Onnanoko o oikaketeiru.</i> '[It is] chasing a girl'. (4)				3		4						
Comprehension of passive sentences	<i>Takusii wa torakku ni hipparare-masita.</i> 'The taxi was pulled by a truck'. (3)					2						3	

scores with age, as well as a high correlation between the overall DSSJ score and the MLU in morphemes (MLUm). They also found large individual differences in the patterns of scores between sub-areas. Another study (Miyata, Otomo, and Nisisawa 2007), which applied DSSJ to the speech of children aged 2–4 years with intellectual disabilities and with autism, also showed that DSSJ scores were correlated with MLUm. However, neither DSSJ scores nor the MLUm correlated with their developmental ages as measured by standardized developmental or language tests, suggesting significant individual variation in language skills relative to the developmental levels in the clinical population. More detailed analysis within each sub-area may reveal characteristics of different types of language disorders, yielding clinical implications.

4.2 Language and Communication Developmental Scale

The Language and Communication Developmental Scale, or LC Scale (Otomo et al. 2013) is a comprehensive language assessment standardized for children up to 6 years of age who are learning Japanese. This scale consists of 64 tasks covering verbal expression, verbal comprehension, and communication. Verbal expression tasks range from simple naming and description of objects and pictures to answering more complex questions. In verbal comprehension tasks, the child answers by pointing to appropriate pictures or manipulating objects to demonstrate understanding of single words, short sentences, and short stories. These language tasks cover the domains of vocabulary, word combinations/syntax, discourse, and phonological awareness. Communicative tasks assess such skills as the child's understanding of gestures, basic interpersonal rules, and emotional states. The scale yields overall developmental ages and developmental quotients, as well as indices of verbal expression, verbal comprehension, and communication. Some examples of the language tasks in the vocabulary and syntax domains are presented in Table 1.

4.3 Language and Communication Developmental Scale for School-age Children (LCSA)

After children enter school, they have abundant opportunities to use language as a means of learning. They are also expected to express their intentions verbally, have discussions with peers, and broaden their knowledge via reading and writing. The Language and Communication Developmental Scale for School-age Children (LCSA) (Otomo et al. 2012) consists of five basic domains and 10 subtests, which correspond to various skills required for school-age children (Table 2).

In the subtest 'comprehension of verbal instructions,' a child is given a verbal instruction and asked to point to appropriate pictures. Students are also expected

Table 2: Five basic domains (A to E) and 10 subtests (1 to 10) of the Language and Communication Development Scale for School-Age Children (LCSA)

A. Auditory comprehension of sentences**1. Comprehension of verbal instructions**

A child demonstrates understanding of verbal instructions by pointing to appropriate pictures.

2. Comprehension of paragraphs

A child demonstrates understanding of a scientific paragraph and a story presented orally by answering a set of questions.

B. Vocabulary and idioms**3. Lexical knowledge**

A child demonstrates the knowledge of words by defining presented words, recalling words from definitions, retrieving antonyms, etc.

4. Idioms and mental words

A child demonstrates understanding of idioms and words describing emotional states by selecting those which best fit given contexts.

C. Verbal expression**5. Sentence production**

A child completes missing case particles or words, describe pictures using given words, etc.

6. Interpersonal expressions

A child demonstrates the appropriate use of polite forms and understanding of irony in interpersonal situations.

D. Flexibility**7. Flexibility: Word retrieval and Inference**

A child retrieves as many words as possible related to a given concept within a time limit, and also make inferences about a given situation.

E. Literacy**8. Oral reading**

A child reads aloud a passage, and the number of reading errors and dysfluencies are counted and reading time is measured.

9. Text comprehension

A child demonstrates understanding of the passage by answering a series of questions.

10. Phonological awareness

A child demonstrates skills related to phonological awareness.

to understand orally presented scientific paragraphs and narratives, which the subtest ‘comprehension of paragraphs’ is designed to assess. The lexical knowledge subtest includes such tasks as verbally explaining the meanings of words, selecting correct definitions of words, and retrieving antonyms, using words expected to be familiar to school-age children as stimuli. In the domain of verbal expression, the sentence-production subtest examines the use of case markers, auxiliaries, and conjunctions in such cloze tasks as *Risu wa usagi () oikake ()* ‘A squirrel is chased by a rabbit’, given a picture of the situation. The use of polite forms such as *sasiageru* ‘give (to an elderly person)’ in interpersonal context is tested in the interpersonal expressions

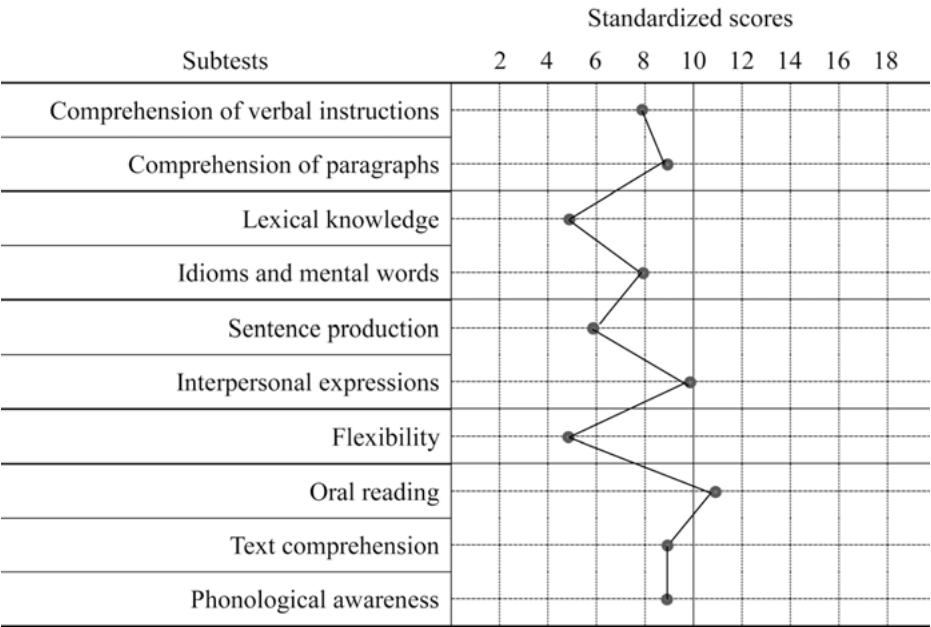


Figure 1: The LCSA profile of a 2nd grade elementary school student.

subtest. In conversations, flexible thinking and smooth retrieval of related lexical items are required. The flexibility domain tests skills to quickly retrieve the names of objects related to a key concept, such as ‘round’ or ‘summer,’ within a time limit and to infer multiple possible causes given a situation. In the literacy domain, accuracy and speed of oral reading, text comprehension, and phonological awareness are evaluated. Skills related to phonological awareness are important in learning *kana*, Japanese syllabary letters, and are examined in such tasks as extracting the middle mora of three-mora words and reversing three- to five-mora words.

This scale is standardized for elementary school children in grades 1 through 4, and a standardized score is provided for each of the 10 subtests. Regarding more global indices, this scale yields the literacy index based on the subtest scores for oral reading, text comprehension, and phonological awareness, as well as the overall LCSA index.

LCSA yields a profile highlighting each child’s strengths and weaknesses. Figure 1 presents the profile graph of a 2nd grade boy with difficulties in verbal communication and academic learning who was receiving additional educational support at his school. The profile reveals that he had particular weaknesses in lexical knowledge, sentence production, and word retrieval. This suggests that expanding vocabulary, increasing sentence-formation skills, and fostering smooth word retrieval are potential areas to be targeted in individualized educational support.

5 Future directions

Compared with the abundance of research on the developmental process of the acquisition of English, there is still a dearth of research on Japanese language development, particularly for special populations. Examination and understanding of the developmental patterns of these populations provide insight into various factors underlying language development. The contribution of input to language development may be examined through research involving hearing-impaired children. However, it is difficult to disentangle multiple factors affecting language development, such as degree of hearing loss, timing of detection of hearing loss, educational history, and communicative environment. Clinically, the recent advancement of cochlear implants, an electrical device that transmits sound signals directly to the inner ear via surgically inserted wires, has provided children with profound hearing loss the opportunity to acquire oral language. The benefits of cochlear implants in language development are apparent (Miyamoto, Svirsky, and Robbins 1997; Tomblin et al. 1999). However, a cochlear implant is not applicable to every hearing-impaired individual, and the auditory sensation gained from such electrical signals is considerably different from the auditory sensation experienced by hearing individuals who receive information with richer temporal and frequency resolution from acoustic hearing. Technological advancement and the improvement of intervention methods are gradually becoming more intertwined.

Specific language impairment, which has drawn the attention of researchers of European languages, is one of the areas not fully investigated in Japanese-learning children. Additional methods are needed to identify high-risk Japanese children with difficulties in grammatical development, especially given that omission of the subject and some case particles are permissible particularly in oral expressions. The relationship between language and cognition, which has long been an important focus of research, is still an area in which we expect studies to yield both theoretical and clinical implications, particularly in children with intellectual disabilities, ASD, and SLI. More specifically, research should elucidate how unique cognitive characteristics are manifested in various aspects of language and the cognitive traits that are linked with children's specific language deficits. From an educational point of view, children with SLI and HFASD are educated with their typically developing peers, and their language characteristics often pose problems with social interaction and learning in classrooms. Understanding their difficulties from the linguistic perspective may allow us to better accommodate students with unique cognitive and developmental styles in an educational setting and help us to establish an intervention approach for those who need additional support.

Standardized assessment tools are employed to reveal strengths and weaknesses in the language domain. They are also essential to place language skills in the larger framework of the individual's cognitive profile. There is a distinct lack of assessment

tools for Japanese children, particularly compared with the abundance of such tools available for English-speaking individuals. The development and use of standardized tools will lead to a greater understanding of how the acquisition of language is affected by other developmental factors. It is essential that we both expand the repertoire of screening tests to identify children at risk and develop deep tests to scrutinize a child's performance level within a specific domain.

References

- Adamson, Lauren B., Roger Bakeman, Deborah F. Deckner, and MaryAnn Ronski. 2009. Joint engagement and the emergence of language in children with autism and Down syndrome. *Journal of Autism and Developmental Disorders* 39(1). 84–96.
- Agatsuma, Toshihiro. 1983. Chōkaku shōgai-ji no sakubun: Kakujiushi [Analysis from a grammatical point of view on the composition written by hearing impaired children: Case]. *Kokuritsu Tokushu Kyōiku Sōgō Kenkyūjo Kenkyū Kiyō* 10. 57–65.
- Agatsuma, Toshihiro, Hiroichi Sugawara, and Hideo Imai. 1980. Chōkaku shōgai-ji no gengo nōryoku (III): Ukemi-yarimorai bun no rikai [Grammatical ability of deaf children: Comprehension of passive, *morau* and *ageru* sentences]. *Kokuritsu Tokushu Kyōiku Sōgō Kenkyūjo Kenkyū Kiyō* 7. 39–47.
- Aizawa, Horomitsu and Tomoyasu Yoshino. 1999. Chōkaku shōgai-ji no bun no seigo handan ni oyobosu tōgo jōhō to imi jōhō no yakuwari [Role of syntactic and semantic information in judgments of sentences' grammaticality by adolescents with and without hearing impairments]. *Japanese Journal of Special Education* 37(3). 23–32.
- Aizawa, Horomitsu and Tomoyasu Yoshino. 2002. Tango ninchi ni okeru tōgoteki • imitekina puraimingu kōka: Chōkaku shōgai-ji to kenchō-ji ni kanshite [Syntactic and semantic priming effects on word recognition in children with and without hearing impairments]. *Japanese Journal of Special Education* 40(3). 293–301.
- Barre, Natalie, Angela Morgan, Lex W. Doyle, and Peter J. Anderson. 2011. Language abilities in children who were very preterm and/or very low birth weight: A meta-analysis. *Journal of Pediatrics* 158(5). 766–774.
- Brown, Roger. 1973. *A first language*. Cambridge, MA: Harvard University Press.
- Clark, John Greer. 1981. Uses and abuses of hearing loss classification. *Asha* 23(7), 493–500.
- Dennis, Maureen, Ann L. Lazenby, and Linda Lockyer. 2001. Inferential language in high-function children with autism. *Journal of Autism and Developmental Disorders* 31(1). 47–54.
- Eilers, Rebecca E. and D. Kimbrough Oller. 1994. Infant vocalizations and the early diagnosis of severe hearing impairment. *Journal of Pediatrics* 124(2). 199–203.
- Facon, Bruno, Thérèse Facon-Bollengier, and Jean-Claude Gruber. 2002. Chronological age, receptive vocabulary, and syntax comprehension in children and adolescents with mental retardation. *American Journal of Mental Retardation* 107(2). 91–98.
- Fujiue, Miki and Kiyoshi Otomo. 2009. Jiheishōji no goi kakutoku ni kansuru kenkyū: Chiteki shōgai-ji to no hikaku ni yoru kentō [Research on the vocabulary of children with autism: A comparison with children with intellectual impairment]. *Bulletin of Tokyo Gakuji University: Division of Educational Sciences* 60. 478–498.
- Fukuda, Shinji and Suzy E. Fukuda. 2001. The acquisition of complex predicates in Japanese specifically language-impaired and normally developing children. *Brain and Language* 77(3). 305–320.

- Fukuda, Shinji, Suzy E. Fukuda, Tomohiko Ito, and Yuko Yamaguchi. 2007. Nihongo o bogo to suru tokuiteki gengo shōgai-ji ni okeru kaku no bunpō shōgai [Grammatical impairment of case assignment in Japanese children with specific language impairment]. *Japan Journal of Logopedics and Phoniatrics* 48(2). 95–104.
- Hirota, Eiko. 1993. Chōkaku shōgai-ji ni okeru sōki kara no chōkaku kōwahō ni yoru gengo shidō no jissai to sono seika [Efficacy of a habilitation system at an early age in hearing-impaired child, by auditory oral method]. *Japan Journal of Logopedics and Phoniatrics* 34(3). 264–272.
- Hunt, Kellogg. 1965. Grammatical structures written at three grade levels. NCTE Research report No. 3. Champaign, IL: National Council of Teachers of English.
- Ito, Tomohiko. 1988. Chōkaku shōgai-ji ni okeru kakujoshi no goyō: Gengogakuteki setsumei no kokoromi [Linguistic analysis of case-markers in utterances of hearing impaired Japanese children]. *Japan Journal of Logopedics and Phoniatrics* 39(4). 369–377.
- J.COSS Kenkyukai (ed.). 2010. The Japanese Test for Comprehension of Syntax and Semantics (J.COSS). Tokyo: Kazamashobo.
- Kail, Robert. 1994. A method for studying the generalized slowing hypothesis in children with specific language impairment. *Journal of Speech and Hearing Research* 37(2). 418–421.
- Kim, Eunju and Tomohiko Ito. 2008. Nihon to kankoku no chōkaku shōgai-ji ni okeru kakujoshi no goyō no hikaku: Kōzōkaku to naizaikaku o chūshin ni [Structural and inherent cases of universal grammar theory: Case-marker errors made by Japanese and Korean students with hearing impairments]. *Japanese Journal of Special Education* 46(1). 19–27.
- Kjelgaard, Margaret M. and Helen Tager-Flusberg. 2001. An investigation of language impairment in autism: Implications for genetic subgroups. *Language and Cognitive Processes* 16(2–3). 287–308.
- Lee, Hankyu and Marguerite S. Barratt. 1993. Cognitive development of preterm low birth weight children at 5 to 8 years old. *Journal of Developmental and Behavioral Pediatrics* 14(4). 242–249.
- Lee, Laura. Louise. 1974. *Developmental sentence analysis: A grammatical assessment procedure for speech and language clinicians*. Evenston: Northwestern University Press.
- Leonard, Laurence. 1998. *Children with specific language impairment*. Cambridge, MA: MIT Press.
- Leonard, Laurence B., Karla K. McGregor, and George D. Allen. 1992. Grammatical morphology and speech perception in children with specific language impairment. *Journal of Speech and Hearing Research* 35(5). 1076–1085.
- Losh, Molly and Lisa Capps. 2006. Understanding of emotional experience in autism: Insights from the personal accounts of high-functioning children with autism. *Journal of Developmental Psychology* 42(5). 809–818.
- Loucas, Tom, Tony Charman, Andrew Pickles, Emily Simonoff, Susie Chandler, David Meldrum, and Gillian Baird. 2008. Autistic symptomatology and language ability in autism spectrum disorder and specific language impairment. *Journal of Child Psychology and Psychiatry* 49(11). 1184–1192.
- McGuckian, Maria and Alison Henry. 2007. The grammatical morpheme deficit in moderate hearing impairment. *International Journal of Language and Communication Disorders* 42 (Supple 1). 17–36.
- Miller, Carol A., Robert Kail, Laurence B. Leonard, and J. Bruce Tomblin. 2001. Speed of processing in children with specific language impairment. *Journal of Speech, Language, and Hearing Research* 44(2). 416–433.
- Miyamoto, Richard T., Mario A. Svirsky, and Amy M. Robbins. 1997. Enhancement of expressive language in prelingually deaf children with cochlear implants. *Acta Oto-Laryngologica* 117(2). 154–157.

- Miyata, Susanne, Makiko Hirakawa, Ruth Kanagy, Yoko Kuriyama, Brian MacWhinney, Masahiko Minami, Kyoko Murakami, Hiro Yuki Nisisawa, Yuriko Oshima-Takane, Kiyoshi Otomo, Tomohiko Shirahata, Hidetosi Sirai, Junko Sirai, Yasuhiro Shirai, Masatoshi Sugiura, and Hiroko Terada. 2006. The development of the CHILDES-based Developmental Sentence Score for Japanese (DSSJ). In Mineharu Nakayama, Masahiko Minami, Hiromi Morikawa, Kei Nakamura and Hidetosi Sirai (eds.), *Studies in Language Sciences* 5. 75–89. Tokyo: Kurosio Publishers.
- Miyata, Susanne, Brian MacWhinney, Kiyoshi Otomo, Hidetosi Sirai, Yuriko Oshima-Takane, Makiko Hirakawa, Yasuhiro Shirai, Masatoshi Sugiura, and Keiko Itoh. 2013. Developmental Sentence Scoring for Japanese. *First Language* 33(2). 200–216.
- Miyata, Susanne, Kiyoshi Otomo, and Hiro Yuki Nisisawa. 2007. Exploring the developmental sentence score for Japanese (DSSJ): A comparison of DSSJ and MLU in spoken language samples from typically developing children and children with delayed development. *Japanese Journal of Communication Disorders* 24(2). 88–100.
- Ogura, Tamiko, Norio Naka, Yukie Yamashita, Toshiki Murase, and Aki Mahieu. 1997. Nihongo kaku-tokuji no goi to bunpō no hattatsu: CLAN puroguramu ni yoru bunseki [Lexical and grammatical development in the Japanese children: analysis through the CLAN program]. *Kobe Daigaku Hattatsukagaku Kenkyū Kiyō* 4(2). 31–57.
- Ogura, Tamiko and Toru Watamaki. 2004. *Nihongo Makkāsā nyūyōji gengo hattatsu shitsumonshi: go to miburi tebiki* [Technical manual of the Japanese MacArthur Communicative Development Inventory: Words and Gestures]. Kyoto: Kyoto Kokusai Shakai Fukushi Sentā [Kyoto International Social Welfare Exchange Center].
- Oller, D. Kimbrough. 1980. The emergence of sounds of speech in infancy. In Grace H. Yeni-Komshian, James F. Kavanagh and Charles A. Ferguson (eds.), *Child phonology 1: Production*, 93–112. New York: Academic Press.
- Oller, D. Kimbrough, Rebecca E. Eilers, Dale H. Bull, and Arlene Earley Carney. 1985. Prespeech vocalizations of a deaf infant: A comparison with normal metaphonological development. *Journal of Speech, Language, and Hearing Research* 28(1). 47–63.
- Otomo, Kiyoshi. 2004. Tokuiteki gengo hattatsu shōgai ni okeru hatsuwa no kentō: Goi tōgo ni konnan o shimesu 2 jirei kara [Syntactic characteristics in specific language impairment (SLI) in Japanese: Analysis of the speech of twins with difficulties in syntax]. *RIEEC Research Report* 3. 1–9.
- Otomo, Kiyoshi, Yoko Wakaba and Takahiro Nara. 1998. Chōteishussei taijūji to seikisan kenjōji no 5 saiji ni okeru gengo nōryoku: Gengo kensa to jihatsuwa bunseki ni yoru kentō [Language skills of extremely low birth weight children and normal birth weight children at 5 years of age: Analyses of language test scores and speech samples]. *Japan Journal of Logopedics and Phoniatrics* 39(1). 24–33.
- Otomo, Kiyoshi, Akiko Hayashi, Soichi Hashimoto, Kazunari Ikeda, and Atsushi Kanno. 2012. *Gakureiban gengo komyunikēshon hattatsu sukēru: LCSA* [LC Scale for School Age Children]. Tokyo: Gakusha.
- Otomo, Kiyoshi, Akiko Hayashi, Soichi Hashimoto, Kazunari Ikeda, and Atsushi Kanno. 2013. *Gengo komyunikēshon hattatsu sukēru: LC sukēru* [Language-Communication Developmental Scale: LC Scale]. Tokyo: Gakusha.
- Owens, Robert E. 2009. *Language disorders: A functional approach to assessment and intervention*, 5th edn. Boston MA: Allyn and Bacon.
- Petitto, Laura Anne and Paula F. Marentette. 1991. Babbling in the manual mode: Evidence for the ontogeny of language. *Science* 251(5000). 1493–1496.
- Rescorla, Leslie and Paige Safyer. 2013. Lexical composition in children with autism spectrum disorder (ASD). *Journal of Child Language* 40, 47–68.

- Rice, Mabel, Kenneth Wexler and Patricia Cleave. 1995. Specific language impairment as a period of extended optional infinitive. *Journal of Speech and Hearing Research* 38(4). 850–863.
- Sakai, Ayaka, Tomoko Tatsumi, and Kiyoshi Otomo. 2014. Kōkinō jiheishō supekutoramuji ni okeru shinteki goi no rikai [Understanding of mental state words in children with high-functioning autism spectrum disorders]. *Japanese Journal of Communication Disorders* 31(3). 150–160.
- Sato, Atsuko, Hiromitsu Aizawa, and Akira Yokkaichi. 2012. Verb usage by children who are deaf: Development of the ability to use verbs differentially according to context. *Japanese Journal of Special Education* 49(6). 701–712.
- Sato, Atsuko and Akira Yokkaichi. 2004. Nanchōji ni okeru dōshi no sanshutsu keikō: Bunmyaku ni yoru imi no gentei no kanten kara [Patterns in verb production by children with moderate hearing impairments]. *Japanese Journal of Special Education* 41(5). 455–464.
- Sawa, Takashi. 2000. Chōkaku shōgai-ji no bun sanshutsu ni okeru kakujoshi to dōshi no jita: Ga to o no kondō o chūshin ni [Relation between case-marker errors and confusion of verbs in written sentences of children with hearing impairments]. *Bulletin of Tokyo Gakuhei University: Section I Science of Education* 51. 179–184.
- Sawa, Takashi. 2010. Chōkaku shōgai-ji no sakubun ni okeru kakujoshi no shiyō to goyō: Shinsōkaku no shiten kara [Uses and errors of case particles in writings of students with hearing impairments: From the standpoint of deep case]. *Japan Journal of Logopedics and Phoniatrics* 51(1). 19–25.
- Sawa, Takashi and Hiromitsu Aizawa. 1998. Chōkaku shōgai-ji seito no bun sanshutsu ni okeru kakujoshi no ayamari: 'ga', 'o' no datsuraku, goyō to dōshi no hitaishōsei [Errors in the use of case particles in sentence productions by students with hearing impairment: Omissions and replacements of 'ga' and 'o', and asymmetry of verbs]. *Bulletin of Tokyo Gakuhei University: Section I Science of Education* 49. 163–168.
- Sawa, Takashi and Tomoyoshi Yoshino. 1994. Chōkaku shōgai-ji no hiyubun rikai ni kansuru jikkenteki kentō [An experimental study of metaphor comprehension in children with hearing impairment]. *Japanese Journal of Special Education* 31(4). 19–26.
- Scarborough, Hollis, Janet Wyckoff, and Robin Davidson. 1986. A reconsideration of the relation between age and mean length of utterance. *Journal of Speech and Hearing Research* 29(3). 394–399.
- Schmidt, Chris L. and Katharine R. Lawson. 2002. Caregiver attention-focusing and children's attention-sharing behaviours as predictors of later verbal IQ in very low birthweight children. *Journal of Child Language* 29(1). 3–22.
- Stoel-Gammon, Carol. 1988. Prelinguistic vocalizations of hearing-impaired and normally hearing subjects: A comparison of consonantal inventories. *Journal of Speech and Hearing Disorders* 53(3). 302–315.
- Stoel-Gammon, Carol and Kiyoshi Otomo. 1986. Babbling development of hearing-impaired and normally hearing subjects. *Journal of Speech and Hearing Disorders* 51(1). 33–41.
- Tager-Flusberg Helen. 1992. Autistic children's talk about psychological states: Deficits in the early acquisition of a theory of mind. *Child Development* 63(1), 161–172.
- Takei, Wataru and Takashi Torigoe. 2001. The role of pointing gestures in the acquisition of Japanese Sign Language. *Japanese Journal of Special Education* 38(6). 51–63.
- Takei, Wataru and Takashi Torigoe. 2000. Rōji no shuwa kakutoku katei ni okeru hi-shijiteki jesuchā no yakuwari [Nonreferential gestures and the acquisition of sign language by two Japanese infants]. *Japanese Journal of Developmental Psychology* 11(1). 12–22.
- Tatsumi, Tomoko and Kiyoshi Otomo. 2009. Kōkinō kōhansei hattatsu shōgai-ji ni okeru dōsago no rikai to hyōshutsu [Development of comprehension and expression of verbs in high functioning children with pervasive developmental disorders: An examination incorporating the adequacy of verbal expressions]. *Japanese Journal of Communication Disorders* 26(1). 11–19.

- Taylor, H. Gerry, Maureen Hack, Nancy Klein, and Christopher Schatschneider. 1995. Achievement in children with birth weights less than 750 grams with normal cognitive abilities: Evidence for specific learning disabilities. *Journal of Pediatric Psychology* 20(6). 703–719.
- Tomblin, J. Bruce, Linda Spencer, Sarah Flock, Rich Tyler, and Bruce Gantz. 1999. A comparison of language achievement in children with cochlear implants and children using hearing aids. *Journal of Speech, Language, and Hearing Research* 42(2). 497–511.
- Torigoe, Takashi and Wataru Takei. 2001. A descriptive analysis of early word combinations in deaf children's signed utterances. *Japanese Psychological Research* 43(3). 156–161.
- Ueno, Kazuhiko, Naoko Nagoshi, and Satoru Konuki. 2008. *PVT-R kaiga goi hattatsu kensa* [Picture vocabulary test-revised]. Tokyo: Nihon Bunka Kagakusha.
- Ullman, Michael and Elizabeth I. Pierpont. 2005. Specific language impairment is not specific to language: The procedural deficit hypothesis. *Cortex* 41(3). 399–433.
- Van der Lely, Heather. 2005. Domain-specific cognitive systems: Insight from grammatical SLI. *Trends in Cognitive Sciences* 9(2). 53–59.
- Watamaki, Toru and Tamiko Ogura. 2004. *Nihongo Makkāsā nyūyōji gengo hattatsu shitsumonshi: go to bupō tebiki* [Technical manual of the Japanese MacArthur Communicative Development Inventory: Words and Grammar]. Kyoto: Kyoto Kokusai Shakai Fukushi Sentā [Kyoto International Social Welfare Exchange Center].
- Welty, Yumiko Tanaka, Jun Watanabe, and Lise Menn. 2002. Language production in Japanese preschoolers with specific language impairment. In Elisabetta Fava (ed.), *Clinical linguistics: Theory and applications in speech pathology and therapy*, 175–193. Amsterdam and Philadelphia: John Benjamins.
- Yoder, Paul J. and Steven F. Warren. 2004. Early predictors of language in children with and without Down syndrome. *American Journal of Mental Retardation* 109(4). 285–300.
- Yoshinaga-Itano, Christine. 1998. Early speech development in children who are deaf or hard of hearing: Interrelationships with language and hearing. *Volta Review* 100(5). 181–211.

14 Revisiting autistic language: “Literalness” and “non-literalness” in Japanese children with autism

1 Introduction

Researchers frequently point to the problem of literalness in autism; people with autism take literally expressions in which the meaning is unclear due to ambiguity, and they are unable to comprehend nonliteral meanings (Frith 1989). Perkins (2007) notes the case of a youth with autism who was asked to “write the days of the week in these seven boxes,” and wrote “the days of the week” in each box rather than actually naming each day. According to Perkins, this failure to comprehend non-literal meaning probably stems from difficulty in drawing inferences. The clinical implication of this is that this problem needs to be approached by lessening the burden of inference placed on the person with autism, through more explicit communication that clearly spells out what is required. Thus, the person with autism should be instructed to “write Monday in the first box, write Tuesday in the second box...” and so on.

However, while the problem of literal comprehension has been recorded through conversational episodes such as the above, there has been insufficient investigation relating to autism in conditions under which there is a failure of nonliteral comprehension, leading to literal comprehension. Furthermore, from a clinical perspective, people with autism give the impression that they do not always comprehend every ambiguous expression literally. In order to identify the factors that result in literal comprehension, it is therefore necessary to combine detailed analysis of numerous conversational episodes with investigation into the way people with autism respond to tasks that have been prepared experimentally. However, there is still a paucity of such techniques, and the only attempts have been along the lines of the few that are outlined below.

“Theory of mind” is a specific cognitive ability to understand others as intentional agents, more specifically, the ability to (1) attribute mental states, such as beliefs, intents, desires, pretending, and knowledge to others; and (2) understand that others have beliefs, desires, and intentions that are different from one’s own. Research in clinical psychology is one of the main areas of application of theory of mind. Particular deficits occur in individuals with autism, for example. They are sometimes referred to as mind-blindness; those individuals who have a “theory of mind” impairment or deficit tend to lack understanding of how their behavior affects others. Specifically, they tend to have difficulty in (1) seeing things from any other

perspective than their own, (2) determining the intentions of others, and (3) understanding social reciprocity. Baron-Cohen (1995) describes two orders of theory of mind ability. First-order theory of mind relates to inferring the thoughts of another person, whereas second-order theory of mind concerns reasoning, i.e., what one individual (other than the self) thinks about another's thoughts. Happé (1993) carried out a study of people with autism aged from 9 to 28 years. The subjects read a short story and were then presented with a task in which they had to select one of two choices regarding the meanings of metaphors and irony used by characters in the story. Only subjects with second order theory of mind were able to comprehend irony, while subjects who had only reached first order theory of mind were able to comprehend metaphor but not irony. Subjects lacking a theory of mind were unable to comprehend either metaphor or irony. Comprehension of the meaning of ambiguous sentences presented in written format requires not only verification of the context, but also involves the further burden of having to read. Such tasks are probably not well suited to young children, who are not proficient readers.

Mitchell, Saltmarsh, and Russell (1997) presented an enactment in which a person put an item in location A and another in location B. The experimenter switched the objects, and the person then requested the item that was now in location B. Children with autism understood literally more frequently than children with Down syndrome. Thus, in response to the question "Now, can you get Dad the bowl he really wants?" children with autism frequently got the bowl in location B rather than getting the bowl that Dad believed to be in location A. Mitchell and his colleagues regard this type of response as a tendency in autism to interpret utterances literally. However, it is likely that rather than comprehension of ambiguous sentences, what is being seen here is comprehension of mistaken belief.

Few studies have challenged the assumption that people with autism demonstrate literalness. As an exception, however, a study by Ozonoff and Miller (1996) suggests a kind of "overnonliteralness" glimpsed in adults with high-functioning autism spectrum disorder (HFASD), despite their pervasive tendency for literalness in understanding humor, drawing inferences, and appreciating indirect requests. Specifically, Ozonoff and Miller (1996) played tape recordings of various episodes to adults with high-functioning autistic spectrum disorder (HFASD). The researchers found that, while people with HFASD performed less well than controls in the comprehension of jokes or stories that require drawing inferences, they showed overnonliteral comprehension in response to ambiguous questions such as "Can you see that house number?" This was a very interesting finding in that it went against the view that people with autism comprehend ambiguous sentences literally. Ozonoff and Miller argue that people with autism have overlearned the rule that "Can you . . .?" questions are not to be comprehended literally. However, this task is limited to just one pattern of indirect utterance, and further study is required to determine whether overnonliteral comprehension is seen in response to a wider range of ambiguous expressions.

Kess and Nishimitsu (1989) note that everyday English expressions include such ambiguities as 1) lexical ambiguity, 2) syntactic surface structure or deep structure ambiguity, 3) ambiguity of case in syntactic structure, 4) ambiguity over whether an action was intentional or accidental, 5) syntactic ambiguity resulting from intonation, 6) indirect speech acts, 7) irony or sarcasm as discourse ambiguity, 8) ambiguity of discourse intent, 9) idioms and metaphors, and 10) children's word games. In Kess and Nishimitsu, Nishimitsu, a native speaker of Japanese, searched for ambiguous expressions in Japanese corresponding to the English expressions described by Kess, a native speaker of English, and put forward as many as 30 or so types of ambiguity.

Given that ambiguous expressions themselves have this level of diversity, it is true to say that the range of ambiguity in the studies mentioned above was not wide enough. Also, Ozonoff and Miller (1996) point out that children with autism show a lack of consistency in nonliteralness and in their methods of comprehension with respect to ambiguous sentences. Bearing this in mind, it will be difficult to obtain an accurate grasp of the problem of literal comprehension in people with autism without a comparative study that examines comprehension of a great variety of ambiguous expressions at the same time.

The present study attempted to compare the results of a study of comprehension by regular elementary school students of the various types of ambiguous expression indicated above (Oi and Takahashi 2005) to new results obtained from children with HFASD in the same grades at school. Oi and Takahashi (2005) drew up 50 ambiguous expressions comprising 17 types of ambiguity, based on Nishimitsu's work. With reference to the methods used by Kaneko (1987) in a study of the comprehension of ambiguous expressions by adults, Oi and Takahashi presented 666 children in grades 2–6 of elementary school with an ambiguous expression and required the children to judge which of two pictures corresponding to the two different comprehensions of the expression was the correct match, on a scale from 1 (literal comprehension) to 5 (nonliteral comprehension). Kaneko (1987) defined bias in the comprehension of a sentence that could be comprehended in two ways as the proportion of subjects that selected one interpretation, and used this to examine structural ambiguity. Kaneko does not categorize comprehension as literal/nonliteral, but in the present study, each sentence was examined by three university students and taken to be nonliteral if they all chose it and literal if they all did not choose it. Simple selection of one of two alternatives was not used because university students who participated in a preliminary study were frequently unsure how to respond. The two factors "comprehension of idiomatic expressions or metaphors" and "use of contextual information" were extracted through factor analysis. With both factors, scores on the linear scale showed a tendency to increase, indicating an increase in nonliteral comprehension, with higher grade in school. Large age differences were seen between fourth and fifth graders in comprehension of idiomatic expressions or metaphors, and between second and third graders in use of contextual information

The aim of the present study was to compare the evaluation scores for each expression given by elementary school students with HFASD to the scores given by regular elementary school students. This permitted a grasp of the degree to which children with HFASD show a bias toward literalness (or else nonliteralness) in their comprehension of ambiguous expressions in comparison to regular elementary school students. At the same time, the study examined what relationship the two factors extracted by Oi and Takahashi (2005) from the results of regular elementary school students have on this bias.

Beside the above, the difference between Japanese and English in terms of language ambiguity was investigated on the basis of findings from Kess and Nishimitsu (1989). According to their study, some sort of difference in linguistic ambiguity is seen between the two languages. We could see the influence of the difference on comprehension of ambiguous language in Japanese children with autism.

2 Methods

2.1 Participants

Table 1 shows a breakdown of the children that participated in this study. The HFASD group included 53 second to sixth graders in an elementary school who were recruited from a self-help group active in the Tokai-Hokuriku region. All had been diagnosed by a psychiatrist or pediatrician as having Asperger syndrome, high-functioning autism, HFASD, or pervasive developmental disorder. Mean full-scale IQ (FIQ) measured on the third edition of the Wechsler Intelligence Scale within 3 years prior to the start of the ambiguous expression comprehension task was 92.26 ($SD = 19.56$).

Table 1: Participant Children's Grade, Gender, and Mean Full-Scale IQ

Grade (year in school)	ESK	HFASD	FIQ
Grades 2–4 (Male: Female)	$N = 30$ (24: 6)	$N = 25$ (22: 3)	
<i>M</i>	3.00 ($SD = .83$)	3.24 ($SD = .72$)	94.52 ($SD = 14.8$)
Grades 5–6 (Male: Female)	$N = 20$ (16: 4)	$N = 28$ (24: 4)	
<i>M</i>	5.50 ($SD = .51$)	5.50 ($SD = .51$)	91.57 ($SD = 23.20$)
Total (Male: Female)	$N = 50$ (40: 10)	$N = 53$ (46: 7)	
<i>M</i>	4.00 ($SD = 1.43$)	4.43 ($SD = 1.29$)	92.26 ($SD = 19.56$)

From Oi and Takahashi (2005)

The elementary school student (ESK) group included 50 second to sixth graders from elementary school who participated in the study of Oi and Takahashi (2005). One class from each of four in grades 2 to 6 in a single elementary school was selected at random, and the first 8 boys and the first 2 girls at the top of the register in each class were selected. Thus, there were 10 students per grade, 50 students (40 boys, 10 girls) in total. With no data available regarding HFASD and other disorders or intelligence, it cannot be completely guaranteed that this group was developing typically with no disorders. Consequently, this group was designated the regular elementary school student group rather than the typically developing group. It was probably a sample that reflected regular school classes, in which children with some sort of developmental disorder account for a little over 6% of students (see endnote 1). No difference in the mean grade at school was found between the two groups. Both groups were further subdivided into grades 2, 3, and 4 and grades 5 and 6 to permit comparison between lower-grade HFASD and lower-grade ESK, and between upper-grade HFASD and upper-grade ESK, in addition to the comparison between the two groups overall. This division into lower and upper grades for comparison was made because Happé (1995) showed that children pass tasks of first order theory of mind, which is possibly related to comprehension of ambiguous expressions, at a linguistic mental age of around 9 years. Therefore, we predicted that there would be differences in the way expressions are comprehended between the upper and lower grades. There were no differences in the mean grade at school between the HFASD group and the ESK group in either the upper or the lower grade subgroups.

2.2 Materials

A total of 50 ambiguous expression tasks drawn up by Oi and Takahashi (2005) were used. The tasks comprised 17 different types of ambiguity, with between two and five tasks for each type. Each task had two pictures, one corresponding to the literal comprehension and one to the nonliteral comprehension of the expression in the

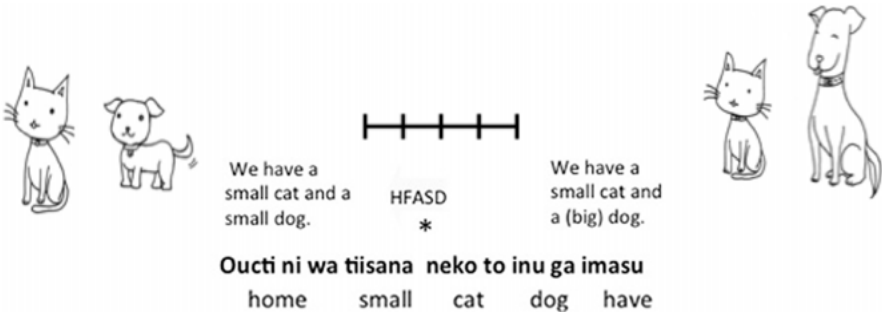


Figure 1: Literal comprehension and non-literal comprehension of an ambiguous sentence

task (see Figure 1). In the study by Oi and Takahashi (2005), three fourth-year university students specializing in education for disabled children rated each of the two pictures for each task as either literal or nonliteral comprehension, and the three students were in agreement for all 50 tasks. *Furigana* (syllabic characters to indicate pronunciation) were added to the *kanji* characters in each task.

2.3 Procedure

The tasks were administered to the HFASD group either individually or in small groups, and to the ESK group in groups by class. Participants were asked to respond by rating on a five-point scale which of the two pictures matched the stimulus sentence. Prior to presentation of the 50 sentences making up the study, two practice tasks were administered. When a child did not understand the procedure, in the HFASD group it was explained by an adult in charge of the group who normally gave guidance to the child, and in the ESK group it was explained by the homeroom teacher for that class. The timing of the tasks was as follows: in the HFASD group, 11 children carried out the tasks in December 2005, and 42 children carried out the tasks in August 2007; the ESK group carried out the tasks in September and October 2004.

3 Results

The results for all 50 ambiguous expression tasks were compared between the HFASD group and the ESK group in all grades, in the lower grades (grades 2, 3, and 4), and in the higher grades (grades 5 and 6) using the Mann-Whitney U-test. In the comparison of all grades, there was a difference between the two groups that was significant at the 5% level (including one-tailed tests) for the 9 tasks shown in Table 2. Of these, 3 showed a bias toward literal comprehension in the HFASD group, and the remaining 6 conversely showed a bias toward nonliteral comprehension. In the comparison of the lower grades, 6 tasks showed significant differences. Five of these were the same as in the comparison in all grades, and the direction of bias was the same. Only task 22 was specific to the lower grades, and this showed a bias toward literal comprehension of indirect speech. In the comparison of the higher grades, none of the tasks showed a significant difference. There were a total of 9 types of ambiguity with a bias toward either literal or nonliteral comprehension. There were significant differences for 2 tasks involving ambiguity in the modifier of parallel nouns, and there was 1 task with a significant difference for each type of ambiguity showing a bias.

Oi and Takahashi (2005) found 13 tasks with high factor loading for the factor “comprehension of idiomatic expressions or metaphors” and 9 with high factor loading for “use of contextual information”. Of the tasks showing bias in the HFASD group in the present study, 1 task showing bias toward literal comprehension corresponded to “comprehension of idiomatic expressions or metaphors”, and 3 tasks showing bias toward nonliteral comprehension corresponded to “use of contextual information”. In the tasks showing a significant difference in the evaluation score between the HFASD and ESK groups, the maximum difference in the mean evaluation score was 1.33, and the minimum difference was 0.21.

4 Discussion

Literalness, which means being in accordance with, conforming to, or upholding the exact or primary meaning of a word or words, has been highlighted repeatedly by researchers to be one of the most prominent characteristics of language in autism ever since the first clinical descriptions of autism by Kanner (1943) and Asperger (1944). That is, a common feature of those individuals with autism can be seen in their difficulty in grasping abstract concepts, meaning non-tangible ideas, objects or things are often hard to understand. The notion of literal mind of autism has been strongly believed among researchers even in the past decade (Frith 2003; Perkins 2007). Empirical studies conducted on this issue by researchers from English-speaking countries have concentrated on comprehension of metaphor and similar constructs (Happé 1993; MacKay and Shaw 2004; Rundblad & Annaz, 2010); however, linguistic ambiguity applies to a far wider range of language (Kess and Nishimitsu 1989). The results of these studies have uniformly indicated deficits in individuals with autism in this respect.

For the majority of the ambiguous expression tasks used in the present study, there was no difference in comprehension between HFASD elementary school children and regular elementary school children. This included irony, which Happé (1993) maintained is comprehended literally by people with autism. The present results are consistent with the results of Yata and Oi (2009), who studied children of school age. As will be discussed below, it is evident that differences between studies in the pattern of stimulus presentation and the method of responding can affect the results. In the study by Happé (1993), as well as in studies by Mitsunashi and Nakamura (2004) and Adachi et al. (2006) that detected difficulty in comprehending irony in school-age children with HFASD, the subjects were presented with written sentences containing irony. To measure comprehension, Happé asked people with autism to select either a literal or a nonliteral meaning for the ironic expression using a closed question that was communicated orally. Adachi et al. (2006) and Mitsunashi and Nakamura (2004) required children to select one of four

Table 2: Fifty task sentences and their type of ambiguity. Mean evaluation scores of all grades and lower grades of HFASD and ESK groups, and the direction of bias in HFASD group.

No.	Task sentence	Type of ambiguity	Factor (*1)
1	Mika took over from Kazu / Kazu turned into Mika	Homonym	1
2	Mai kept a dog / bought a dog		
3	Nobody felt better / was able to get up		1
4	The queen ate / was eaten	Syntactic ambiguity	
5	The prince laughed / was laughed at		
6	Her purse is on the ground / Her purse is falling		2
7	They have a small cat and a dog at home / They have a small cat and dog at home	Ambiguity of modifier of parallel nouns	
8	A white dove and a crow / A white dove and crow are perched on the telegraph wire		
9	A big beetle and an ant are fighting / A big beetle and ant are fighting		
10	Mayu was hit by a car / Mayu bumped into a car	Ambiguity of case	2
11	Taku was hit by a stone / Taku hit the stone		2
12	He caught his hand in the door / put his hand into the door	Deliberate or accidental	2
13	He hit his foot on the door / kicked the door		2
14	Hey Mum, I broke a cup / the cup broke	Extent of the negation	
15	Taro is not tall like Jiro		2
16	He went to school without eating breakfast / ate breakfast and didn't go to school		
17	Cross the road without carefully looking left and right / Carefully look left and right and don't cross the road		2
18	Taku gave a present to Shin and Kazu / Taku and Shin gave a present to Kazu	Case relation and syntactic construction	
19	The policeman and Dad caught the robber / caught Dad and the robber		
20	Dad baked the sweet potato he received in the garden	Deductive sentence	
21	The policeman chased the thief who had escaped in a patrol car		
22	"Is your mother there?" "Yes, she is."	Indirect speech action	
23	"Can you open that window?" "Yes."		
24	"You're a genius, aren't you?"	Ironic and conversational ambiguity	
25	"You're a nice older brother, aren't you?"		
26	"Shall I give you a chocolate?" "OK / That's OK."	Ambiguity of conversational intent	2
27	"Shall I give you this for homework?" "OK / That's OK."		
28	"How about some more juice?" "That's OK, thank you / OK."	Idiom	2
29	Mum is proud of you / has a long nose		1
30	Big brother is in a bad mood / has got his belly button in a twist		1
31	Dad is confused / is twisting his neck	Metaphor	1
32	Hiking up mountains is hard / You will break a bone hiking up mountains		1
33	Table legs		1
34	Mum scolds Dad / sits on Dad		1
35	A doctor-to-be / doctor's egg		1
36	Be in a risky situation / cross a dangerous bridge	Pun/joke	
37	The sun shone / smiled		
38	Oh, careful! / Husband, careful!		
39	It's a wolf / Oh, it's paper	Riddle	
40	What are the lips you have in your face / what is the building you have in your face?		2
41	What has flowers and water in its mouth and stands up?		2
42	What school do mice go to?		
43	Who eats with his mouth? / makes a living from the mouth?		
44	Quibble / Dwindling shoes	Homonym (mistaken meaning)	2
45	Take your footwear off here / your clothes off here		2
46	A star you can see during the day / A clothes pole you can see during the day		
47	Even when you make an effort you don't move forward / Even when you dial you don't move forward		
48	Those chocolates look nice	Demonstrative	
49	I'd like to play in that park		
50	Isn't that cat Tama?		

No.	Literal/nonliteral		Mean evaluation score				Direction of bias of comprehension of children with HFASD			
	Literal	Nonliteral	ESK all grades	ASD all grades	ESK grade 2-4	ASD grade 2-4	Comparison of all grades		Comparison of grade 2-4 (*2)	
1	Change	Take over	3.64	3.96	3.57	3.96				
2	Buy	Keep	2.82	3.17	2.70	2.72				
3	Stay sitting	Be depressed	2.68	2.47	2.73	2.67				
4	Passive	Honorific	2.22	2.38	2.43	2.13				
5	Passive	Honorific	2.82	3.13	3.17	2.83				
6	Progressive	Result	4.30	4.46	4.37	4.42				
7	Puppy	Adult dog	2.76	2.19	2.87	2.20	Literal	$p=2.07 P<0.05$	Literal	$p=1.68 P<0.05 (*4)$
8	White crow	Black crow	3.84	4.13	3.90	4.24	Nonliteral	$p=1.69 P<0.05 (*4)$		
9	Giant ant	Small ant	4.08	3.62	4.10	3.60				
10	Hit forehead [Does this match the picture? Please check.]	Run over	3.72	4.08	3.83	3.96				
11	Jump	Hit	4.04	4.25	4.17	4.12	Nonliteral	$p=2.00 P<0.05$		
12	Deliberate	Accidental	4.10	4.47	4.27	4.28	Nonliteral	$p=1.92 P<0.05 (*4)$		
13	Deliberate	Accidental	3.82	3.98	3.93	3.96				
14	Neutral	Responsible	2.98	3.10	3.17	3.42				
15	Jiro is short	Jiro is tall	4.00	3.89	4.07	3.88				
16	No school	No breakfast	2.88	2.68	2.70	2.56				
17	Stop	Accident crossing road	3.68	4.06	3.73	4.24	Nonliteral	$p=1.90 P<0.05 (*4)$		
18	Both	Only one	1.86	1.79	1.83	1.88				
19	Dad caught	Dad helped catch	3.24	2.33	3.43	2.21	Literal	$p=2.46 P<0.05$	Literal	$p=2.24 P<0.05$
20	Eat in kitchen	Eat in garden	3.60	3.92	3.40	4.08	Nonliteral	$p=1.66 P<0.05 (*4)$	Nonliteral	$p=1.92 P<0.05 (*4)$
21	Robber in patrol car	Policeman in patrol car	2.72	3.12	2.60	2.56				
22	Answer	Call mother	2.88	2.46	3.33	2.24			Literal	$p=2.78 P<0.01$
23	Answer	Open window	3.60	3.47	3.77	3.76				
24	Picture scored 100	Picture scored 10	1.58	1.60	1.53	1.36				
25	Mother smiles	Mother angry	1.66	1.62	1.57	1.52				
26	Receive chocolate	Refuse chocolate	3.90	3.28	3.87	3.60				
27	Homework	No homework	3.22	4.04	3.13	4.40	Nonliteral	$p=3.05 P<0.01$	Nonliteral	$p=3.39 P<0.01$
28	Receive juice	Refuse juice	4.20	4.15	4.07	4.36				
29	Long nose	Proud	3.10	3.09	3.03	2.68				
30	Twisted belly button	Bad mood	3.26	3.34	2.97	3.12				
31	Twist with hands	Lean head to one side	3.53	3.55	3.47	3.42				
32	Broken bone	Hard work	2.92	3.14	2.73	2.75				
33	Person's leg	Normal table	4.59	4.39	4.50	4.25				
34	Under backside	Mum angry, Dad apologizes	2.98	3.37	2.83	3.04				
35	Egg	Child doctor	3.56	2.83	3.53	2.20	Literal	$p=2.07 P<0.05$	Literal	$p=3.03 P<0.01$
36	Bridge	Worried faces	2.10	2.13	2.10	1.72				
37	Smiling sun	Sun shines between clouds	2.06	2.15	2.33	2.00				
38	Mother falls	Father falls	3.26	3.18	3.13	3.36				
39	Toilet	Wolf	2.02	1.92	1.97	1.83				
40	Building in face	Lips	4.12	3.92	4.13	3.48				
41	Person with flower in mouth	Vase	3.86	3.86	3.80	3.42				
42	Mice with school rucksacks	Junior high school mice	3.29	3.33	3.72	2.96				
43	Meal	Dentist	1.62	1.74	1.57	1.72				
44	Shoes	Cheeky	3.72	3.41	3.63	3.21				
45	Clothes	Footwear	4.08	3.78	4.37	3.60				
46	Sun and stars	Clothes pole	2.96	3.22	3.23	2.84				
16	Treadmill	Telephone	2.44	2.53	2.17	2.17				
48	On desk	Other person	3.82	3.35	3.67	3.33				
49	Place in middle distance	In thought balloon	2.80	2.80	2.70	2.79				
50	Other person facing away	Other person facing speaker	3.86	3.76	4.00	3.67				

or five written options. In contrast to these methods, in the present study, children were required to compare written expressions of irony against pictures depicting literal and nonliteral meanings and to rate the pictures. Yata and Oi (2009) showed irony in pictures and in writing, and required the children to choose one of three meanings presented verbally and in writing. What the use of pictures appears to suggest is the possibility that elementary school children with HFASD readily comprehend irony. The lack of bias in comprehension of expressions other than irony shown by elementary school children with HFASD in the present study is probably for the same reason. It is possible that any bias toward literal comprehension was weakened because contextual information for use in comprehending ambiguous expressions can be more readily obtained from pictures than from written text. Moreover, it is possible that the picture selection response pattern that characterizes the present study makes responding easier than having to select the response from several written meanings or else respond verbally. Yata and Oi (2009) showed four-frame comic strips to elementary school children with HFASD. When the children were required to put the meaning of indirect requests made by characters in the comics into their own words, they comprehended literally; when they were required to select the meaning from alternatives prepared by adults, they comprehended non-literally. It may thus be seen that the comprehension of ambiguous expressions is affected by the method of responding to the stimulus sentence.

At the same time, it would not be true to say that there was no bias in the comprehension of ambiguous expression tasks by the children with HFASD who participated in the present study. However, a bias toward literal comprehension was seen in no more than 4 tasks, while a bias toward nonliteral comprehension was seen in 6 tasks, which thus exceeded the literal bias. One source of bias toward literal comprehension is failure to comprehend a metaphor (task 35), and this was the same result as that of Happé (1993). However, there was no bias in comprehension in the other four metaphor tasks (33, 34, 36, 37). Thus, there is a need to investigate the meaning of the differences in comprehension of different tasks.

The second source of bias toward literal comprehension was where the case marked by “and” was taken to be the object and not the subject of the verb (task 19, see appended figure). It seems likely that rather than comprehending that someone helped the policeman to catch a robber, children with HFASD selected the response depicting what would be the normal course of events, which is that the policeman caught someone. The third source of bias toward literalness was indirect speech actions (task 22). The literal comprehension of indirect requests agreed with the result of Paul and Cohen (1985), who studied autistic adults with mild retardation. However, no bias in comprehension was found in a separate indirect speech task (23), indicating differences in comprehension due to the different tasks. The fourth source of bias toward literal comprehension involved ambiguity in parallel nouns (task 7), and this probably depends on the meaning comprehension of the linguistic structure. However, task 8, which was the same type of ambiguity, showed

a bias toward nonliteral comprehension, again indicating differences in comprehension due to the different tasks.

The bias toward nonliteral comprehension in children with HFASD seen in the present study has a similar aspect to the overlearning of nonliteral meaning described by Ozonoff and Miller (1996). Their question "Can you see that house number?" would commonly be used in countries such as the United States by someone in a residential district looking for a particular house. It would not be customary to use this in the specific case of asking simply whether or not the listener is capable of seeing the numerals of the house number (as in, for example, to compare eyesight).

In 2 of the 6 tasks that were biased toward nonliteral meaning comprehension, a realistic event that came about by accident was selected in preference to an action intentionally carried out by an unrealistic agent (tasks 11, 12). To choose the literal meaning in these tasks, it would be necessary to assume the intention of an agent that goes against convention, and an unrealistic incident resulting from this, from the verb contained in the sentence. In the present study, the elementary school children with HFASD chose the more realistic alternative, whereas the regular elementary school children tended to select the unrealistic picture depicting a situation resulting from the unconventional intention of an agent in the sentence. From the point of view of the hypothesis of literal comprehension in autism that to date has been largely unchallenged (Ozonoff and Miller 1996), this is a paradoxical finding. However, to look at it in a different way, it is probably difficult for children with HFASD to ascribe various intentions that are divorced from conventional reality to the characters of a sentence. Where there was a negation and more than one verb in the sentence, children with HFASD took the negation to cover a broad scope within the sentence and selected the realistic incident (task 17). This presumably has the same background as tasks 11 and 12 mentioned above, in that the children did not assume intentions at odds with convention or an unrealistic incident. In tasks 7 and 8, literal comprehension of the relationship between the modifier and the parallel nouns results in a cat as big as a dog and a white crow; if we assume that these are eliminated due to lack of realism, then the situation appears to be the same here as well. In task 20 (deductive sentence), the modifier could refer equally to the verb immediately following it or to the verb separated from it without being unrealistic, but the children were probably influenced by the visual knowledge of sweet potatoes baked in the garden in a fire of fallen leaves; while this may not be part of the reality of children with an urban lifestyle, it has become a stereotype in the media. With ambiguous conversational intent (task 27), the bias toward nonliteral meaning probably followed the pattern of exchanges in conventional conversation. In this case, too, it is likely that children are unable to assume different intentions removed from conventional stereotypes.

The results of the present study show that meanings are divided three ways, into 1) bias of HFASD elementary school children toward literal comprehension, 2) same

level of comprehension in HFASD and regular school children, and 3) bias of HFASD elementary school children toward nonliteral comprehension. Future work is needed to clarify these by comparing different tasks of the same type of ambiguity. This would require an examination of the expression, the details of the pictures, and the relationship between the pictures and the expression. A good subject for this examination would be parallel noun-type ambiguity, as the results of the three tasks involving parallel nouns in the present study were divided in the three ways indicated above. The implication from the present study is that if a picture showing a literal meaning is unconventional or unrealistic, there will be bias toward nonliteral comprehension; if it is not, there will be bias toward literal comprehension.

Oi and Takahashi (2005) investigated the 50 tasks for comprehension of ambiguous expressions used in the present study, and indicated that from among the 666 regular elementary school students there were 13 tasks with factor loading of 0.35 or greater for the factor “idiomatic expressions or metaphors,” and 9 with factor loading of 0.35 or greater for the factor “use of contextual information.” Of these, only 4 coincided with the tasks in which the HFASD group showed bias, and no obvious relationship was found between the two factors. This suggests the possibility that the abilities contributing to comprehension of ambiguous expressions in children with HFASD differ from those in regular elementary school students.

There were fewer significant biases in the comparison between lower grades than in the comparison between all grades. One possible reason for this is the statistical processing problem of differences in group size. The absence of differences in the upper grades probably reflects cognitive and linguistic development in relation to comprehension of ambiguous expressions. When children pass the linguistic mental age of 9 years they acquire first order theory of mind (Happé, 1995), suggesting the possibility that they can more readily comprehend nonliteral meaning.

The results of the present study suggest that people with autism comprehend ambiguous expressions literally under specific conditions; they do not unconditionally comprehend all language literally, and this includes metaphor and irony, which are linguistic facts that have traditionally been considered to sensitively reflect the characteristics of autism. In the tasks that showed bias, the difference in the mean rating scores between children with HFASD and regular elementary school children was not particularly large, which also implies that the viewpoint of a simple dichotomy – children who do not have autism comprehend nonliterally, children with autism comprehend literally – is inadequate. The fact that comprehension may tend toward the literal or may become nonliteral depending on the type of ambiguity, the expression, and the way the stimulus is presented suggests that comprehension varies along a literal-nonliteral continuum rather than a dichotomy. From the present study it may be assumed that conventionality of meaning is one factor contributing to such variation, and future work is needed to clarify all of the factors and to construct a highly valid method for evaluating literal comprehension.

Finally, we can see the influence of differences between Japanese and English on comprehension of ambiguous language in children with autism. As for ambiguity of modifier of parallel nouns (as shown in #7 in Table 2) the Japanese children with autism showed literalness. In Japanese an adjective can modify parallel nouns without deleting specific marker such as indefinite article “a” in English. By deleting “a” from English nouns, they can show clearly that the adjective modify both of parallel nouns. Contradictory to this notion, however, the Japanese children with autism did not show literalness in #8 of Table 2 despite this being also ambiguity of modifier of parallel nouns. Quite the contrary, they showed nonliteralness in this task. For the children with autism “white crow” seemed to be inconceivable. It could be said that Japanese children with autism prefer literal meaning when comprehending modification of parallel nouns unless the comprehension contradicts conventional knowledge such as “The color of a crow is usually black”.

In addition to this, literalness was seen in the task in which language is ambiguous in terms of syntactic role and syntactic construction (#19 in Table 2). In English the order of words (here “policeman”, “dad” and “caught”) clearly indicates the syntactic role played by the word and bears no ambiguity in this regard. To indicate that “dad” plays a syntactic role of subject of the sentence in Japanese, they need additional word which modifies “caught”. The word “together” could be a candidate here. Japanese children with autism seem to need additional modifier in comprehending language ambiguous in terms of syntactic role nonliterally.

Another case of literal comprehension was seen in one out of 5 metaphorical statements (#35 in Table 2). In the task particle “no” in Japanese statement such as “Oishasan (Doctor) no (possessive or appositive) Tamago (an egg)” makes ambiguity. Such ambiguity cannot be shown in English as the two meanings (“Doctor’s egg” or “doctor-to-be”) are realized in different constructions. “No” in Japanese has various meaning other than possessive or appositive. As far as “no”, Japanese looks more ambiguous than English and easier leads to literalness in children with autism.

Acknowledgments

Some of the material included in this chapter has appeared in Oi and Tanaka (2010, published by Japanese Journal of Communication Disorders) and Oi and Tanaka (2011, published by Asia Pacific Journal of Speech, Language, and Hearing). We are grateful to these two journals for permission to rework here material that originally appeared in their pages. Part of this work is also supported by a grant-in-aid (basic research [B] [2], no. 14310059; head researcher, Noboru Takahashi). The authors would like to thank Ms. Harue Ohoka of Nihon Fukushi University Chuo College of Social Services, and all others who assisted in this study.

References

- Adachi, Taeko, Shinichi Hirabayashi, Madoka Shiota, Shuhei Suzuki, Eiji Wakamiya, Shinji Kitayama, Masaki Kono, Yukinori Maeoka and Tatsuya Koeda. 2006. Hiniku-bun tesuto o mochiita chūi-kekkan/tadōsei-shōgai (AD/HD), Asperger shōgai, kō-kinō jiheishō no jōkyō-ninchi ni kansuru kenkyū [The study of situational recognition of attention deficit/hyperactivity disorders, Asperger's disorder and high functioning autism with the Metaphor and Sarcasm Scenario Test (MSST), Nō to Hattatsu (Official Journal of the Japanese Society of Child Neurology), 38, 177–181.
- Asperger, Hans. 1944. Die “Autistischen Psychopathen” in Kindersalter. Archiv für Psychiatrie und Nervenkrankheiten 117. 76–136.
- Baron-Cohen, Simon. 1995. *Mindblindness: An essay on autism and theory of mind*. Cambridge, MA: MIT Press.
- Frith, Uta. 1989. *Autism: Explaining the Enigma*. Oxford, UK: Basil Blackwell.
- Frith, Uta. 2003. *Autism: Explaining the Enigma*, 2nd edn. Oxford, UK: Blackwell.
- Happé, Francesca. G. E. 1993. Communicative competence and theory of mind in autism: A test of relevance theory. *Cognition* 48(2). 101–119.
- Happé, Francesca. G. E. 1995. The role of age and verbal ability in the theory of mind task performance of subjects with autism. *Child Development* 66(3). 843–855.
- Kaneko, Yasuo. 1987. Kōzō-jō no tagibun no rikaijō no katayori to bun-shori-katei: Nihongo no baai [Biases in the interpretations of structurally ambiguous sentences and the human sentence processing in Japanese], Kiso Shinrigaku Kenkyū [Official Journal of the *Japanese Psychonomic Society*] 6(1), 1–10.
- Kanner, Leo. 1943. Autistic disturbances of affective contact. *Nervous Child* 2. 217–250.
- Kess, Joseph F and Yoshihiro Nishimitsu. 1989. *Linguistic ambiguity in natural language*. Tokyo: Kurosio Publishers.
- MacKay, Gilbert and Adrienne Shaw. 2004. A comparative study of figurative language in children with autistic spectrum disorders. *Child Language Teaching and Therapy* 20(1). 13–32.
- Mitchell, Peter, Rebecca Saltmarsh, R., and Helen Russell. 1997. Overly literal comprehension of speech in autism: Understanding that messages arise from minds. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 38(6). 685–691.
- Mitsuhashi, Yoshinori and Nakamura Keisuke. 2004. Keido hattatsu shōgai-ji no tasha ninchi ni kansuru kentō: kanjō ninchi kadai to kansetsu hatsuwa kadai kara mita tokusei. Memiors of the Faculty of Education and Regional Studies Fukui University, Series IV, Science of education, 60. 41–52.
- Oi, Manabu and Noboru Takahashi. 2005. Goyō no nōryoku no hattatsu to sono hyōka “pāsonaru konpyūtā o mochiita tekiōgata gengo nōryoku shindan kensa” no sakusei [Development and evaluation of computer based “adaptive tests for language abilities in Japanese”] 2002–2004 Grant-in-Aid for Scientific Research (B)(2) from the Japanese Ministry of Education, Science, Sports and Culture (Grant No. 14310059), 87–94.
- Oi, Manabu and Sanae Tanaka. 2010. Kōkinō jiheishō supekutoramu no aru kodomo no tagiteki hyōgen no rikai [Comprehension of ambiguous language in children with high-functioning autism spectrum disorder] *Japanese Journal of Communication Disorders* 27(1). 10–18.
- Oi, Manabu and Sanae Tanaka. 2011. When do Japanese children with autism spectrum disorder comprehend ambiguous language overliterally or overnonliterally? *Asia Pacific Journal of Speech, Language, and Hearing* 14(1). 1–12.
- Ozonoff, Sally and Judith N. Miller. 1996. An exploration of right-hemisphere contributions to the pragmatic impairments of autism. *Brain and Language* 52(3). 411–434.

- Paul, Rhea and Donald J. Cohen. 1985. Comprehension of indirect requests in adults with autistic disorders and mental retardation. *Journal of Speech and Hearing Research* 28(4). 475–479.
- Perkins, Michael. 2007. *Pragmatic impairment*. New York: Cambridge, University Press.
- Rundblad, Gabriella and Dagmara Annaz. 2010. The atypical development of metaphor and metonymy comprehension in children with autism. *Autism* 14(1). 29–46.
- Yata, Aiko and Manabu Oi. 2009. Kō-kinō jiheishō supekutoramu shōgai-ji no kansetsu-hatsuwarikai ni taisuru kentō [Comprehension of indirect speech in children with high-functioning pervasive developmental disorders]. *LD Kenyū [Japanese Journal of Learning Disabilities]* 18(2). 128–137.

VI Translation

Judy Noguchi, Atsuko Misaki, Shoji Miyanaga, and Masako Terui

15 Towards a robust, genre-based translation model and its application

1 Introduction

Translation is a complex task requiring near native-speaker knowledge of the source and target languages. In countries where the target language is not commonly used (e.g., an environment where English is a foreign language), acquiring such knowledge is a challenging undertaking. This chapter will first explain the rationale for developing a model of genre-based translation, describe the model, and then present findings for applying this model for translation from Japanese to English. Many approaches to translation exist, but few have seriously applied a genre-based approach employing concepts and tools from work in systemic functional grammar and English for specific purposes (ESP). Such a model can help resolve word choice, register, and rhetorical issues that appear in translation, especially between languages such as Japanese and English where there is considerable linguistic distance. The model raises awareness of the language features of both source and target texts as well as of their discourse community environments. It employs analysis and deconstruction of texts to identify rhetorical structures and uses dedicated corpora to select suitable terminology and phrasing for the target texts. When applied, the model can lead to diachronic development of genre awareness to lay the basis for continued and autonomous improvement of translation skills and thus the production of better target texts.

- (1) *Dere wasa dis frogg / Gone jumpa offa da logg / Now he inna bogg.*
(Young 1995)

This is one rendition of the famous Matsuo Basho poem “*Huru ike ya / kawazu tobikomu / mizu no oto*”. It appears to be in Hawaiian Pidgin English. There are numerous translations of the poem, and One Hundred Frogs: From Matsuo Basho to Allen Ginsberg by Hiroaki Sato (1995) offers a collection of one hundred different versions. The Pidgin version is quoted here to show that there are many possible ways to translate a text. Another more serious example is the famous Dante’s *Inferno* that has appeared in at least 50 English versions in the 20th century (Thomson 2002). The acclaimed Ellis (1994) version is presented in the Yorkshire dialect because, as the translator states, the original intention of Dante was to offer the poem in vernacular Italian so that it could be accessible to the general public.

If there are many ways to translate a text, what would be the best translation? In order to find the answer to this question, this chapter will first explore “translation” itself, which has been described as both an art and a skill (Baker 1992), i.e., some-

thing that can be considered to be acquired via academic education or vocational training. It will then propose a model for translation from Japanese into English where the linguistic distance can cause problems. For example, at the interpersonal level, Japanese has a range of verbs for the English “give”, depending on who (senior or junior status of the giver) “gives” something to whom (senior or junior status of the receiver): *yarū*, *ageru*, *morau*, *kureru*, *itadaku*, and *kudasaru* (Baker 1992: 23). Finally, this chapter will present specific examples of how the model is being used to teach translation in a training course in Japan and the results of its application.

2 Defining translation and its circumstances

Translation is almost as old as the profession of writing itself. This is because of the important role that translation has played in the transfer of knowledge from one community to another over time. Montgomery (2000), tracing the movements of knowledge in ancient times, describes the efforts of Demetrius Phalereus, a student of Aristotle. Phalereus tried to make available Jewish books of history, law, and philosophy through the great library of Alexandria, which he helped to found in the 3rd century B.C. One translation project is recorded to have been undertaken by 72 scholars from the twelve tribes of Israel and completed in 72 days. This transfer and construction of knowledge via translated texts is even more important today as clearly expressed by the title of Newmark’s paper “No global communication without translation” (2003). One charming example noted by Newmark is that of a museum in Brussels having exhibit captions in only French and Dutch. On observing this, Newmark suggested that English be added, not because he is a native English speaker, but because English, serving a *Lingua Franca*, would make the museum more accessible to people who do not know French or Dutch but, in today’s world, are likely to have some command of English (Newmark 2003: 60).

In general, there are two types of translation, fiction and non-fiction, as writing itself is usually classified into two types, literary and non-literary. Newmark (2003: 57) refers to literary writing as describing “the sphere of the mind and of language” and to non-literary writing as describing the sphere “of reality and the world”. However, Newmark (2003:60) notes that Bühler (1934/1984) originally pointed out that there are actually three types of writing: (a) literary/expressive, (b) persuasive/directive, and (c) informative. In other words, the non-literary texts can be further divided into persuasive texts, such as advertisements or political or religious manifestoes, and informative texts where the main purpose would be to transfer information.

Of these three types of translation, that of literary/expressive texts as well as persuasive texts would require “a profound competence in the relevant target language (TL), and knowledge of its culture” (Newmark 2003: 60). Such a stipulation of a translator working into his/her mother tongue was made at the UNESCO General

Conference meeting in 1976 in Nairobi as follows: “a translator should as far as possible translate into his or her own mother tongue or into a language of which he or she has a mastery equal to that of his or her mother tongue” (Newmark 2003: 60). Similar wording is used to express this in the Code of Professional Conduct of the Institute of Translation & Interpreting, a professional organization of translators and interpreters in the United Kingdom:

Subject to 4.4 and 4.5 below, members shall translate only into a language which is either (i) their mother tongue or language of habitual use, or (ii) one in which they have satisfied the Institute that they have equal competence. They shall translate only from those languages in which they can demonstrate they have the requisite skills.

The ethicality of a translator working into his or her native language is understandable when we consider the multiple levels of equivalence, from the semantic to the pragmatic, that must be dealt with in translation, i.e., words, collocations, idioms and fixed expressions, grammatical categories, textual structures, cohesion, and pragmatic coherence (Baker 1992). Even with “words”, we must seriously consider what we mean when we say that we “know a word”. From extensive research on reading, Grabe (2009: 267) lists nine components that contribute to “knowing a word”: orthography, morphology, parts of speech, pronunciation, meanings (referential range, variant meanings, homophones), collocations, meaning associations (topical links, synonyms, antonyms, hyponyms), specific uses (technical, common), and register (power, politeness, disciplinary domain, formality, slang, dialect form). A formidable list indeed, but an average educated American adult would have word knowledge of about 40,000 words, or about 20,000 word families (base word forms, inflectional forms, and closely related derivational forms) and would have encountered approximately 88,000 word families in his or her natural environment (Grabe 2009: 269). Contrast this with the average English language learner for whom the goal is to learn the first 2,000 to 3,000 word families with the ultimate aim of knowing about 9,000 word families in order to comprehend about 98% of a text and be a fluent reader. This gap in word knowledge alone puts the non-native English speaker at a disadvantage.

The obvious question would then be, why not simply use native English-speaker translators. The most obvious answer is, of course, that there are not enough trained native English-speaker translators who have an adequate knowledge of Japanese. However, there is another facet to this question. It is that the relative number of native English speakers is declining due to the growth in the use of English as a second language (L2) (Graddol 2003), which means that the number of L2 users of English is rising as recipients of translated documents (House 2003), perhaps requiring consideration of different levels of English complexity. For example, there are examples of the purposeful use of simple English in the Simple English Wikipedia (http://simple.wikipedia.org/wiki/Main_Page), which has 96,340 articles as of March 3, 2013, and by Voice of America, which offers VOA Special English

(<http://learningenglish.voanews.com/>), a website of news and stories for learners of English. This suggests that it would be reasonable to develop a translation model for consumption by users of English as a second or additional language. Who better to undertake such translations than these English users themselves?

An alternative to using human translators would be to turn to machine translation and computer-aided translation. Unfortunately, while progress is being made, there is still much work to be done before human translators can be replaced by machines, even for rather formulaic informative types of translation that more readily lend themselves to repeated use of phrases and language patterns. Take, for example, the work of Bach et al. (2010), who reported 88.58% accuracy in discriminating the requisite and effectuation parts of legal sentences (specifically in the Japanese National Pension Law Corpus) based on linguistic features, problem modeling, and tag settings. While this paper documents an achievement in the field, it also attests to the fact that much more work needs to be done before machine or computer-aided translation can become a viable alternative to trained human translators.

Under the circumstances in which there is a need for global communication, especially for the translation of informative texts, and yet there are not enough trained native-English speaker translators who can undertake such work nor the technology, one solution lies in training Japanese speakers to do this work. Thus, this chapter will focus on developing a model for non-literary informative translation into English by Japanese language speakers.

3 Developing a genre-based translation model

3.1 Working with non-native English speaker translators

The Code of Professional Conduct of the Institute of Translation & Interpreting quoted above in relation to translating into one's mother tongue actually starts with the caveat "Subject to 4.4 and 4.5 below,..." Section 4.4 refers to contractual arrangements and 4.5 to provisions for "exception".

4.5 Exception Where a Principal¹ requires a member² to carry out work in circumstances which contravene the provisions of 3.2.2, 4.1 or 4.3 above, the member may, exceptionally, accept the work provided always that:

- a) the member has taken appropriate steps, preferably putting his concerns in writing, to ensure that the Principal is fully aware of the risks involved
- b) the member has satisfied himself that the Principal is genuinely aware of the risks involved
- c) the Principal has expressly agreed to accept the risks involved, preferably in writing
- d) the work carries or is accompanied by a cautionary notice.

¹ "Principal" refers to the person commissioning the translation work.

² "Member" refers to a person who has joined the Institute of Translation and Interpreting.

This “Exception” section outlines the issues that need to be taken into consideration when a person will be translating into a language that is not his/her native language or one of habitual use. In other words, in the present day circumstances of Japanese texts needing translation, if the work must be done and there is no native English speaker who has the requisite skills in Japanese to undertake it, then a Japanese speaker trained in translation may, with an understanding of the risks involved, take on the job. The question now becomes one of what the optimal training method would be.

In searching for the answer, let us consider Neubert’s (2003) discussion of semantic and pragmatic translations. “Semantic” translations refer to the procedure of adapting the meanings of the subject text to the new environment of the target text, while “pragmatic” translations involve the notion of reproducing the contextualized meanings of the subject text in the target text. To illustrate these concepts in action, Neubert takes up the term “social translation” used by Newmark (2003). He surmises that Newmark derived this term from the translation of “social texts”, or texts that deal with individuals and groups, for example, a document issued by the United Nations. This concept of texts as existing for a group of people and requiring translation to be understood by the members of this group, as they are not necessarily in physical or geographical proximity and would not likely to be habitually using the same language, offers a valuable hint as to how non-native speaker translators might be effectively trained.

3.2 Laying the theoretical basis of a genre-based approach to translation

Translation studies have been influenced by various areas of linguistics, such as “textlinguistics, sociolinguistics, psycholinguistics, cognitive linguistics, critical linguistics”, according to Schäffner (2000: 1). The reason for the influx from such a wide range of disciplines is that for a text to be translatable, it must first be understood with respect to the communicative purposes for which it was originally created in a specific sociocultural context. In other words, it is not only the surface linguistic structures that need to be considered but the communicative and pragmatic impact of the text. Schäffner (2000) mentions the work of Anna Trosborg (1997a, 1997b, 2000) of the Aarhus School of Business (Denmark) who uses a model based largely on register (Halliday 1978) and genre analysis (Bhatia 1993; Martin 1984; Swales 1990a, b). This genre analysis approach is specifically applied by Pezzini (2008) to the translation of research article abstracts with details including the matching of repeatedly used phrases.

Genre analysis, a term coined by Swales (1990b), is part of a robust area of work in English for specific purposes, or ESP. Like translation studies, ESP has benefited from an influx of concepts from many related areas. Belcher (2004) describes the

development of ESP with input from sociodiscoursal, sociocultural, and sociopolitical tracks. The sociodiscoursal work examines the relationship between the discourse and society, or the discourse community in which the text occurs. This involves the identification of moves, or the rhetorical framework of a text (e.g., Swales and Feak 2000). The foundations of sociodiscoursal work can be traced to the Systemic-Functional Linguistics movement of Halliday (1978), which was subsequently pursued by the Sydney School (Halliday 1992; Leckie-Tarry 1995).

While machine translation per se has not sufficiently developed to be able to produce translations unaided by human pre- and post-editing, computer-based tools can be of great aid to the translator. Of particular importance are the contributions from corpus linguistics, beginning with the dictionaries and pattern grammars from Collins COBUILD (Francis et al. 1996, 1997) and extending to the identification of frequently used phrases and expressions, i.e., lexical bundles or multiword expressions, used to package the information (Hyland 2001, 2003, 2008; Cortes 2004, 2006). As Hunston (2002: 1) states at the beginning of her book on *Corpora in Applied Linguistics*, “It is no exaggeration to say that corpora, and the study of corpora, have revolutionized the study of language, and of the applications of language, over the last few decades”. In the case of the application of corpora to translation, parallel corpora and multilingual corpora can offer specific target expressions to allow the translator to make the optimal choices (Hunston 2002; Vintar 2008) and comparative corpora can be used to identify stylistic differences between natural-sounding language and that produced by translators influenced by the source text (Hunston 2002).

The other major tributaries of sociocultural and sociopolitical streams are important for developing the training aspects of a non-native speaker translator model and for defining the very aims of the model itself. The sociocultural stream in ESP identifies a novice-expert composition of the discourse community that makes it important to scaffold the entry of newcomers to a professional discourse community (Lave and Wenger 1991). This acculturation of a novice does not refer to merely surface features but to acquisition at a deeper level of, for example, “identifying oneself as an engineer and then learning how to navigate through the community networks” to aim for “‘accountable disciplinary knowledge’ which takes into account the context in which the knowledge is to be used” (Stevens et al. 2008: 357). Again we have mention of the importance of “context”.

Anyone working professionally with language must develop a sense of awareness of both the text and its context. In reviewing the various theoretical streams feeding into ESP theory, Belcher (2004: 178) concludes by saying “I would characterize the goals as aimed at a multidimensional knowledge of where discourses and their communities, as well as the ESP professionals committed to understanding and teaching them, are situated in the world at large”. Here let us use the term “systemic literacy” to express this in a compact manner. The concept of this word is introduced by Brown (2008: xi) as follows:

“The world becomes more complex and interconnected at a lightning-fast pace, and almost every serious social issue requires an engaged public that is not only traditionally literate, but adept in *a new, systemic literacy*. This new literacy requires an understanding of different kinds of feedback systems, exponential processes, the unintended consequences inherent in evolving social systems, etcetera”. (emphasis ours)

The third tributary to ESP from the sociopolitical stream has two aspects: the questioning of the simple acceptance of English as the language of global discourse communities and the rise of different forms of ELF, or English as a Lingua Franca. From the viewpoint of ideology and learners’ rights, Master (1998) has discussed the positive and negative aspects of English dominance, and Benesch (1999) has examined the power relations in academia in an article appearing in *English for Specific Purposes*. By 2003, Graddol (2003: 152), as mentioned above, notes “the decline of the native speaker” in terms of relative numbers and the rise of L2 speakers. This trend has led to a call for respecting the multicompetencies of ELF users, who possess more than one language and culture. This means that when considering the difference between bilingualism and multiculturalism, “while native-speaker norms and conventions of accuracy and appropriateness are relevant for the former in differing degrees, based on the context of use, they are essentially irrelevant for the latter” (Alptekin 2010: 107). In other words, ELF is “a language variety without a culture or native speakers” that is used by speakers who possess at least one other language and culture (Alptekin 2010: 107).

3.3 Setting the features of a genre-based ESP model of translation

Let us now consider how to develop a translation model to answer the question of “If there are many ways to translate a text, what would be the best translation?” The conditions before us are as follows:

1. The translator may or may not be a native Japanese speaker who will be working from Japanese as a source language to English as the target language.
2. The language model will be based on an ESP view of language as it is used by specific discourse communities.
3. The concept of “genre” in ESP will be used to identify the language features of both the source and the target texts.
4. The texts will be viewed from a systemic literacy standpoint; i.e., with an awareness of the contexts in which they function and their roles in these contexts.
5. The specific linguistic features can be identified using corpus linguistics and other language analysis tools.

Let us now consider these points in more detail. The first defines the translator as someone who may or may not be a native Japanese speaker because even a native

English speaker with a good working knowledge of Japanese could benefit from a genre-based model, which can reveal the information frameworks and optimal words and phrases to guide the reader through the genre framework. The second point of assuming the ESP view of language is particularly important for the translation of non-literary informative texts. This is because of the manner in which information is transferred within professional communities, where the participants can influence the shaping of the societies in which they are active. The beginnings of an ESP view of language can be traced to a sociocognitive theory of genre with roots in Kuhn's theory of scientific revolutions (Kuhn 1962), which led to the discussion of "tacit knowledge and scientific networks" by Collins (1982) and the "invisible college" idea proposed by Price (1963). By the 1980s, these groups of people who influence their contemporary societies were being referred to as "discourse communities" (Bizzell 1982, 1992; Swales 1990a,b; Berkenkotter et al. 1991). In other words, they were communities bound by their discourse, not physical proximity. As their professional interactions increased and became more and more complex, as would be the case in a discourse community of scientific researchers in a specific discipline, they came to require the means for communication that could effectively and efficiently transfer information among the members of the community. Such texts that are actively used by discourse communities are now referred to as "genres" (Swales 1990a; Paltridge 1996), which possess characteristic conceptual, rhetorical, and lexical features to facilitate the packaging of information for transfer and retrieval. When a genre assumes specific features, it can be used by discourse community members to achieve their "private intentions within the framework of socially recognized purpose(s)" (Bhatia 1993: 13). Understanding the roles that genres play in influencing society can guide the choices made when working on a translation piece. Also, corpus and other discourse analysis tools can make evident the preferred lexical, grammatical and other choices.

3.4 Implementing the genre-based translation model

To make the translator aware of the genre features of the source text, the OCHA approach to language learning, which is explained below, can be useful (Noguchi 2003). As Baker (1992: 4) states in her textbook on translation, "translators will need something other than the current mixture of intuition and practice to enable them to reflect on what they do and how they do it. They will need, above all, to acquire a sound knowledge of the raw material with which they work: to understand what language is and how it comes to function for its users". Being a good translator implies being a good language learner, i.e., being able to fully grasp the texts being dealt with. This is the basis of the OCHA approach, which encourages the learner to

Observe the features of the text.

Classify the features.

Hypothesize about the roles of the features.

Apply what has been hypothesized to understand or create the text.

As this model is constructed with the aim of aiding translation of informative non-literary texts, it deals with the genre texts repeatedly used by discourse communities for efficient communication. This means that the translator should know the genre features of both the source and target texts. The features of the text to be observed can be summed as PAIL (Noguchi 1997):

Purpose: What is the text trying to do in the source language context and what will it be doing in the target language context?

Audience: Who is the text aimed at in the source and target language contexts? What level of knowledge can be assumed for the two audiences? This may differ in the case of cultural material.

Information: What kind of information does the source text include and would it be the same in the target text?

Language features: What kinds of language features does the source text use to reach its target audience and realize its purpose(s)? Can this be replicated in the translation?

The purposes of the source and the target texts could be different. For example, in the case of the Dante translation discussed at the beginning of this chapter, the Ellis translation was specifically aimed at achieving the original purpose of Dante to reach a wide general public audience, while other translations may have been aimed at more educated groups. Depending on the audience at which the target text is aimed, the information in the source text may need to be supplemented or altered. Issues of equivalence may arise and should be weighed against the purpose of translating the source text. For example, when translating a recipe of a Japanese dish for a website that can be globally accessed, some explanation of the ingredients (e.g., food peculiar to Japan) would be necessary that may not appear in the original Japanese version for a Japanese audience. Here is another interesting example from Bible translation, which can be considered as a type of informative translation if the text is to be used for the dissemination of religion (Best 1978: 33):

How is the *lamb of God* to be explained to an Eskimo? This problem first arose acutely for those translating the Bible into the languages of the Eskimo since there is no word for *lamb* in those languages. What is worse, there is no equivalent concept. It is possible to render the '*lamb of God*' by the '*baby seal of God*'; but the seal occupies a different place in the mind of an Eskimo from that which the lamb did in the mind of a Palestinian of Jesus' day.

Best (1978) continues the discussion of word choice and also points out the differences between the hunting/fishing culture of the Eskimos³ and the pastoral/agricultural culture of the Palestinians. So, what was finally used as the translation? Sisler (1994) reports: When the Bible calls Jesus, “the lamb of God”, the Eskimo phrase becomes “God’s special thing that looks like a caribou calf”.

A visual image of the genre-based translation model is presented in Figure 1. The language features that need to be observed include the rhetorical structure, word choices (see Section 1 for a list of “word” features), grammatical choices, formatting and phonological features of both source and target texts. In the case of informative non-literary texts, the rhetorical structure conventions of the target text may differ from that of the source text. For example, Japanese business letters have a different physical format from English business letters and the rhetorical structure differs, with Japanese business letters having formulaic seasonal greetings at the beginning but English business letters starting with the business itself.

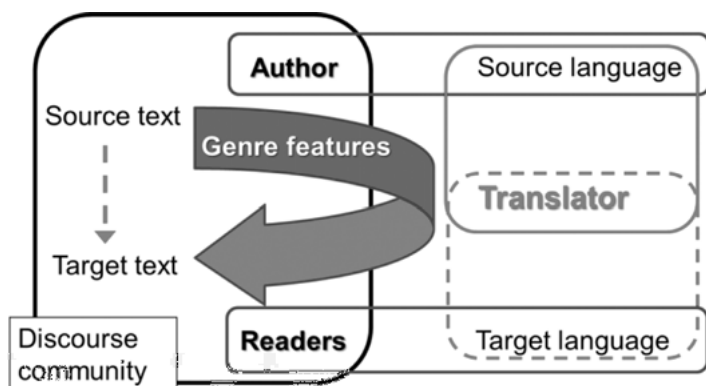


Figure 1: Visualization of the genre-based translation model (Miyanaga et al. 2012)

3.5 Raising awareness of the source text Japanese

Before describing the details of implementing the model, let us examine one major feature of Japanese texts that can be problematic in translation. As hinted in the introductory section, Japanese has traditionally been a hierarchical society with much importance placed on maintaining social harmony. The work of Chie Nakane, a Japanese anthropologist/sociologist, reveals how this is expressed in everyday interactions such as terms of address (Nakane 1970: 27):

³ These people call themselves the Inuit; Eskimo is an Algonquian term.

Let us imagine, for example, the case of X, once a student of Y, who, fifteen years afterwards, becomes a professor in the same department as Y and thus acquires equal status. X still addresses Y as *sensei* and will not refer to him as *dōryō* (colleague) to a third person. Y may address X as *kun*, treating him, that is as *kohai*, even in front of X's students or outsiders: Y has to be most broad-minded and sociable to address X as *sensei* in such a context (i.e., the English usage of Dr. or Professor). It may also be that when X is well known, but Y is not, Y may intentionally address X as *kun* in public in order to indicate that, 'he is superior to X, X is only his *kōhai*'.

This importance placed on social relationships is often difficult to express in English texts.

4 Applying the genre-based translation model

4.1 Using the genre-based translation model for translator training

Now let us examine how the translation model described in Section 3 is being applied to Japanese-to-English translator training at one of the major English-language schools in Japan. The school was founded in 1980 in Tokyo by an organization, established in 1965, which specializes in providing interpreter services at international conferences. The organization currently offers interpreting and translating services, conference organization services, and other language-affiliated services. The translator training course under discussion is offered at the Osaka school of the organization (Misaki et al. 2011).

One term of the Japanese-to-English translator training course is six months long with once-a-week classes lasting 2 hours and meeting 18 to 19 times. The class size is kept relatively small, ranging from a minimum of four students to a maximum of twelve. The class is conducted by several instructors. The main instructor, a native speaker of English, has worked extensively as a translator and a teacher of English for specific purposes (ESP) for students majoring in science, engineering, and medicine. The other instructors are native speakers of Japanese, who, after having taken this translator training course, have been working as translators in various fields or have obtained graduate degrees in teaching English as a second/foreign language and become English language instructors at institutions of higher education.

Those interested in enrolling in courses offered by the school undergo a series of screening tests, including written and oral interview tests. Those who wish to enroll in the translator training course need to demonstrate sufficient basic language knowledge and usage skills of English before learning how to apply their abilities to learning how to translate texts into a non-mother tongue language.

The translator training course has a Japanese-to-English translation assignment every week for 18 sessions per term. At the end, there is a final exam, which consists

of a listening component with questions on the content, a section on summary writing of a text of about 500 words, a cloze section, and a text to be translated from Japanese to English. A student attaining a score of 80 points or more on the 100-point test is eligible to enroll in an advanced translator training course.

4.2 Student characteristics

Students in the translator training course are asked at the beginning of each term to give their permission, on a voluntary basis, to use their translation work data for research. The demographic data from the permission form show that the proficiency levels of the students range from 730 to 985 for TOEIC⁴ and from 500 to 623 for the TOEFL PBT version. Most of those enrolled in the translation training course are mature students in their 30s through 50s. Most are employed in a variety of occupations, for example, office workers in companies, government workers, and high school teachers. All of the participants are highly motivated to acquire or improve their skills in Japanese to English translation; some have a strong desire to become professional translators while others have an imminent need in their work situations to upgrade their language skills.

4.3 Assignments of informative non-literary texts

“Genre” has been defined by Noguchi (2006) as a communicative event consisting of three components: 1) specific “substance”, the content or meaning that needs to be communicated or transferred from the source text to the target text, 2) the “form”, the type of text, such as a newspaper news article or a press release, and 3) the “action”, or the function the text serves in society (Terui et al. 2007). Based on this definition, students in the course are given translation assignments from a range of genres and fields. Some examples are news reports, press releases, instruction manuals, CEO messages, public notices, and legal documents. The fields dealt with include business, international politics, public health administration, biotechnology, manufacturing, science, fashion, and arts. To maintain student motivation and enable them to deal with different genres from different fields, the assignments are chosen from texts submitted by the students themselves. As the students enrolled vary from term to term, this allows the adaptation of the materials to suit the needs of the current class. In one term, for example, there were a businessperson in the securities field, a city government worker, and an employee of an employment agency, while in another term, there were a staff member of an academic institution with international research interests, an office worker who needed to conduct business correspondence in English, and a person doing voluntary work in a liaison position at the city office for foreign residents. Although their immediate needs differ widely,

⁴ TOEIC is administered in some 120 countries around the world. In Japan, many companies, schools, and other organizations utilize the test as a common global yardstick for measuring English skill and thus stipulate TOEIC scores for entry-level job openings.

the coursework and classroom procedures repeatedly emphasize the basic tenets of the genre-based translation model and encourage them to apply what they have learned in tackling tasks on their own. When using student-submitted material, the person who submitted the text is asked to explain its context in the field and the reason for its choice. This initiates the discussion on trying to grasp the position of the text in the discourse community that it is aiming to serve. By doing this, the instructor can demonstrate how the model can be applied to any text and adapted to any context. Thus, each text is used to showcase the genre-based approach and its adaptability to a range of texts from different fields and of different registers.

4.4 Coursework

In the six-month course employing the ESP genre-based translation model, each assignment to translate a text is given prior to the class session so that the students can come ready to discuss the issues to be dealt with for the genre under consideration. Each assignment is handled according to a procedure developed to allow the students to put into practice the theoretical points discussed above. At the start of each term, the students are introduced to the concepts of genre/field, PAIL, OCHA, move analysis, and corpus analysis. By going through this procedure, students ultimately acquire the skills to deal with various types of real-life translation assignments that they may encounter in their work or personal interest areas. As many are interested in working as professional translators, they are made aware of the fact that most of the translation work that is outsourced is of the non-literary informative type of text that is the focus of this translation model.

Upon receiving an assignment text, students are instructed to proceed as follows:

- (1) Receive the assignment text.
- (2) Find field and/or genre reference materials related to the assignment text. Start building a mini-corpus that can be used as reference for the assignment and a core corpus for future work in related fields.
- (3) Observe the language features of the assignment text. Specifically, this step involves the following:
 - a. Observe the appropriate references and find expressions that may be applied to the particular assignment
 - b. Observe and analyze moves (the general order of information) in the text
 - c. Conduct corpus analysis using available corpora and personally built corpora consisting of references found for the assignment in order to search for solutions to rhetorical, lexical, grammatical and technical issues encountered while translating
- (4) Translate the assignment text from Japanese to English as a first draft.
- (5) Send the translated text to the administrative office along with URLs of references and/or information on other resources as well as any questions and comments. This is done about one week prior to the class session in which the text will be discussed.

- (6) Discuss materials and issues in class with other students and the instructor.
- (7) Do a rewrite of own translation based on the in-class discussion and submit it for further checking.
- (8) Examine instructor comments on the rewritten translation.

5 Case studies

5.1 Corpus analysis

The genre-based model places importance on discourse community usage of words and phrases. In order to examine this, tools and techniques from corpus linguistics are employed. As mentioned above, students are told to find suitable references for the assignment text. The next step is to use concordance software to find specific examples of word and phrase usages to guide their translation work.

For corpus analysis, the students use a KWIC (key word in context) concordance program that shows citations in single lines with the target words placed at the center of each line. The advantage of this format is described by Johns (1986) as it “facilitates rapid scanning of a number of citations in order to examine the linguistic features that the contexts have in common”. The concordance program also provides such information as how many times the target word/expression is used in the references, and what word comes before/after the target word/expression.

Here are three examples of a corpus discovery exercise showing how students follow the OCHA approach: they 1) observe the language features in the references, such as expressions specific to the genre and/or field, verb tenses, and modals; 2) classify differences in such language features; 3) hypothesize on how such language features are used; and 4) apply their hypotheses to their translation. The comments and sentences in italics were written by the students in English, and their errors are not corrected by the authors except in one case, which is presented in brackets.

Student A:

- 1) Observe own corpus consisting of 15 text files of confidentiality agreements
- 2) Classify differences in nouns that come after “tangible”
When I looked for references to translate a confidentiality agreement in class, it seemed to me that “tangible” often appeared with a word “object”. I want to know what nouns come after “tangible”.
- 3) Hypothesize from the findings
11 out of 15 items use “tangible” for one to three times. In addition to “object”, “information”, “form”, and “material” come after it.
- 4) Apply to making own sentences
All confidential information of our company, in tangible or intangible form, must be protected against disclosure. Otherwise, our company may not be able to keep a firm position in this industrial field.

Student B

- 1) Observe own corpus consisting of 315 text files of business letters in the patent field
- 2) Classify differences in meanings between “amend” and “rewrite”
We often ask agents to edit the contents of document. When we ask to edit the document, I wonder which word is correct to use in this context.
- 3) Hypothesize from the findings
In a lot of letters, the term “amend” is more often used than “rewrite” and any other word. I think it is a feature on the patent field, which use “amend” to mean editing the document. I had never heard “amend” before I worked in this field. I think this is a one of the reasons why people feel patent work is difficult. Namely there are a lot of specific words in this field, so that these words will become a hurdle.
- 4) Apply to making own sentences
Following the Examiner’s suggestion in Response to Argument on page 5, Claim 1 has been amended to change “a support plate for directly receiving a back face of battery” to “a support plate, which directly receives a back face of the battery”.

Student C

- 1) Observe own corpus consisting of 37 text files in scientific research papers of the pharmaceutical field
- 2) Classify differences in nouns that come after “compared with” and “compared to”
To confirm the explanation in a grammar book that “compared to” is used when emphasizing similarities while “compared with” is used when emphasizing differences.
- 3) Hypothesize from the findings
It seems that there are more number (amount)-related words after “compared to”. Of 37 articles, only 3 articles contain both “compared with” and “compared to”. It may be just writer’s preference.
- 4) Apply to making own sentences
Our products attract younger consumers compared with those made by our counterparts.
The quality of our product can be compared to that of best-selling product on Japanese market.

5.2 PAIL analysis

An important part of the genre-based model is identifying PAIL, which stands for Purpose, Audience, Information, and Language Features as described in Section 3.4. Both the source text and target text are examined and discussed on the basis of these four key elements, which serve as guidelines during the translation process.

To illustrate PAIL analysis, let us examine a translation assignment from the Yakushima Ecotourism Guidebook (Ministry of the Environment of Japan) for the

Yakushima World Heritage site on a small island located to the south of Kagoshima, the southern tip of the Japanese archipelago. The assignment as shown below is on the section of the guiding principles for ecotour guides who lead ecotourists through the Heritage site.

<p>「屋久島ガイド」は、次の共通ルールのもとで活動しています。</p>	
	
<ol style="list-style-type: none"> 1. 利用者の安全を最優先に考え行動する。 2. 大雨洪水警報発令中は、危険が予想される場所でのガイド活動は行わない。 積雪通行止め等の時は、県道、町道には車を乗り入れない。 3. ツアーにあたって、安全管理上の注意やフィールドでの注意事項を十分に伝える。 4. 屋久島世界自然遺産地域等に関わる環境保全関係法令を遵守する。 5. 特定資格を必要とする活動（スキューバダイビング等）については、資格を有さない者は行わない。 6. 各集落の水源の取水口箇所より上流（約一キロ）の沢でのガイド活動は、行わない。 7. 水場の上流を汚さない、踏み込まない、水質汚染防止に留意する。 8. トイレのないところで用を足すときは、湿原、水場、沢、美観地区を避け、環境を保全する。 9. 花之江河等の湿原には踏み込まない。 10. 怪我・事故には、ガイド同士協力しあって対処する。 11. 野生動物に餌を与えない。 12. 心得や共通ルールに基づいて、来訪者に対してより良い利用への協力を促す。 13. 山に動物を連れて行かない。（盲導犬・聴導犬・介助犬を除く） 14. 事業地域の農業者、林業者、魚業者、その他企業や居住者とのトラブルや苦情が発生しないよう、事前の理解を求めるようにする。 15. 祠などの神聖な場所の環境をけがさない。 	

Figure 2: Assignment text: Guidelines for Yakushima Ecotour Guides

Source: (Yakushima Ecotourism Guidebook)

The PAIL discussed in class for this assignment was as follows:

Purpose: What is the text trying to do in the source language context and what will it be doing in the target language context?

The text is trying to inform ecotour guides of the rules and recommendations that they should keep in mind while serving as ecotour guides. As some ecotour guides from overseas may not have a command of Japanese, the rules are to be translated into English.

Audience: Who is the text aimed at in the source and target language contexts?

The text is aimed primarily at ecotour guides in both Japanese and English language contexts.

Information: What kind of information does the source text include and would it be the same in the target text?

The text gives fifteen guiding principles which ecotourist guides should keep in mind.

Language features: What kinds of language features does the source text use to reach its target audience and realize its purpose(s)? Can this be replicated in the translation?

The text consists of a list of rules and recommendations for the ecotour guides. In English-language texts, rules are often delivered in the form of imperative sentences.

Through the PAIL analysis of the assignment text, the students became aware of the genre features of the text and, as a result, reached a conclusion that the imperative verb form frequently used in the target language be applied to the translation although it was not used in the original Japanese, which read like a list of polite requests. The following passage illustrates a list of guidelines expressed in the imperative sentence form taken from Google Webmaster Tools (2013). When examples are presented from a different field, the students are made aware of the fact that this is an example of form but not of substance.

Genre example: Design and content guidelines (Google Webmaster Tools 2013)

- Make a site with a clear hierarchy and text links. Every page should be reachable from at least one static text link.
- Offer a site map to your users with links that point to the important parts of your site. If the site map has an extremely large number of links, you may want to break the site map into multiple pages.
- Keep the links on a given page to a reasonable number.
- Create a useful, information-rich site, and write pages that clearly and accurately describe your content.
- Think about the words users would type to find your pages, and make sure that your site actually includes those words within it.

Via PAIL analysis, students learn to gain an overview of a source text from various perspectives before they start translating, and to consider what may be

necessary for producing the target translation text. The findings of PAIL analysis serve as guidelines in the subsequent process of finding relevant reference materials and translating into the target language.

5.3 In-class discussion

Questions and comments raised by the students are turned in together with their translations of the assignment and are discussed in class. Here are some examples of such questions and comments. The first set is about how to translate the titles of four ordinances of the Japanese Ministry of Health, Labour, and Welfare that appeared with abbreviations of their alternative names commonly used in brackets. The assignment, or the source text, was the publication of quality assurance activities of a pharmaceutical company on its website. In terms of genre, the source text is a section on quality assurance provided by the company. Table 1 shows the Japanese titles of the four ordinances and their official English translations. These abbreviations are commonly used in combination with Japanese words in Japanese texts, although the common names in English are rarely used in Japanese texts.

Table 1: Titles, English Translations, and Common Names of Ministerial Ordinances

Japanese title	Official English translation	Common name
医薬品及び医薬部外品製造管理 及び品質管理の基準 (GMP)	Ministerial Ordinance on Standards for Manufacturing Control and Quality Control for Drugs and Quasi-drugs	Good Manufacturing Practice
医薬品等の品質管理の基準 (GQP)	Ministerial Ordinance on Standards for Quality Assurance for Drugs, Quasi-drugs, Cosmetics and Medical Devices	Good Quality Practice
医薬品等の製造販売後安全管理 の基準 (GVP)	Ministerial Ordinance on Standards for Post-marketing Safety Management for Drugs, Quasi-drugs, Cosmetics and Medical Devices	Good Vigilance Practice
医薬品の製造販売後の調査及び 試験実施の基準 (GPSP)	Ministerial Ordinance on Standards for Conducting Post- marketing Surveillance and Studies on Drugs	Good Post-marketing Study Practice

Three students, struggled with the translation of the long ordinance titles and pondered about whether or not the literal, official translations of those titles would be suitable in the context, when considering the impact on readers of the target

text. These comments were originally written in Japanese and were translated into English by the co-authors.

Student D:

I found, for example, that the English title of GMP on the website of PMDA was “Ministerial Ordinance on Standards for Manufacturing Control and Quality Control for drugs and Quasi-drugs”, but FDA of the US and the authorities of Canada and the UK use Good Manufacturing Practice. I think that this short version is common in Japan, so I used this term with “so-called”.

Student E:

It seems difficult for people in general to grasp the meaning of GMP, GQP, GVP, and GPSP. Is it better to translate them in a more explanatory manner? Or is it better to use the official translations for these words? I’m afraid that the official translations are long and therefore would disturb the tone of the text.

Student F:

I wondered about how far I need to translate such terms as GMP and GQP. Since GMP is also used in English, I thought I didn’t have to literally translate the Japanese official title of the GMP ordinance. I also thought that readers would grasp the meaning of GQP and GPSP from English translations, and therefore I avoided literal translation. On the English website of Takeda Pharmaceutical Company, the English short versions of these ordinance titles were annotated, and I thought that that was useful.

These comments were discussed in class, along with the question of who would be the target audience for this quality assurance section of a pharmaceutical company. The students concluded that they would use the short versions, such as Good Manufacturing Practice, in the target text, because the text is targeted at professionals or stakeholders who are likely to be familiar with these regulations rather than the general public.

5.4 Awareness of genre: Comparison of 1st draft and rewrite

In this section, we compare the 1st drafts and rewrites of student translations to offer implications of increasing awareness of the students of genre features. The source text here is a news report in a Japanese newspaper, and the discussion focused on the translation of notes at the end of the lead. Let us look at three examples shown in Table 2. The sentences in the table, including using or not using parentheses, brackets, italics, bold print, and punctuation, are as they appeared in the students translations.

Table 2: Comparison of Student 1st Drafts and Rewrites

Source text (日米安保条約は3面「きょうのことば」参照) = 関連記事2, 3面に		
	1st draft	Rewrite
Student G	(Japan-U.S. Security Treaty is referenced in “Today’s Word” on the p. 3) – related articles on the p. 2, 3.	(For more on U.S.-Japan Treaty, see “A Phrase for the Day” on p. 3; Related stories on p. 2 & 3)
Student H	(See also the third page “Today’s Words” about the Japan-US Security Treaty.) [Authors: The second half is missing.]	(For more on the Security Treaty, see “A Phrase for the Day” on p. 3. Related stories on p. 2 & 3)
Student I	(Japan-U.S. Security Treaty is referenced in “Today’s Word” on the p. 3) – related articles on the p. 2, 3.	(For more on U.S.-Japan Treaty, see “A Phrase for the Day” on p. 3; Related stories on p. 2 & 3)
Student J	(See [Cf.] p. 3, “quotes of today” for U.S.-Japan Security Treaty) Related stories: Page 2 and 3	For the Japan-U.S. Security Treaty, see “Phrase for the Day” on p. 3. Related stories on page 2 and 3.

All of the 1st drafts are grammatically correct and make sense. However, they look odd as notes in a news article because the order of the information provided is not in conformity with those in English news articles. In other words, in this case, the phrase starting with “for” should come first, followed by the imperative sentence. These revisions were made possible by applying the OCHA approach to the reference articles collected by the students.

5.5 Awareness of rhetorical structures

Students in the course are introduced to the concept of observing and analyzing a text to become aware of its overall structure. The analysis is done by identifying the moves of the source and target texts. Although detailed move analysis is not carried out, working repeatedly with texts in a certain genre and reading relevant reference materials in the genre can lead to an awareness of the rhetorical structure of a text that can guide the student in making appropriate choices for sentence structures, tenses, vocabulary, and the ordering of information. Finding appropriate reference materials and observing moves to grasp the rhetorical structure of a text are essential components of the genre-based translation model. The reference materials are essential for finding possible solutions to difficulties encountered during the translation process.

Let us examine a translation assignment of a news/press release by a corporation to see how moves observed in press release texts can assist students in determining the tense choice and the information order.

Table 3: Move Observation of the Source Text (Hitachi, Ltd. 2010)

Press release by Hitachi	Move observation
日立、「スマートシテイ（次世代都市）」の実現に向けた事業統括組織を新設	Title: Action to be taken by the company
2010年3月11日15時51分	Date and time of release
株式会社日立製作所は、スマートグリッドを基盤とする次世代技術を駆使した、CO2排出量が少なく、高効率で、より環境負荷の低い社会インフラが構築された次世代都市(スマートシテイ)の実現に向けた事業を強力に推進、拡大していくため、2010年4月1日付で、社長直轄の組織として「スマートシテイ事業統括本部」を設立します。	Action to be taken and the reason for the action Order of information 6. Purpose of the action 7. Action to be taken
近年、世界各国において、地球温暖化を抑制しながら、持続可能な生活環境を作り出すための社会インフラが整備されたスマートシテイへの取り組みが進められています。スマートシテイとは、制御技術と情報技術を活用したスマートグリッド技術を基盤として、再生可能エネルギーを用いた分散型発電システムや電気自動車の充電システムが整備された交通インフラと省エネルギーで、高効率な空調装置などを用いたビル、住宅などの都市システムなどが結合した、高度で自律化された次世代都市です。特に新興国では、電力、鉄道、水道、空港、港湾といった社会インフラの構築が同時平行して進められることが予想され、市場規模は全体で100兆円以上と推定されています。	Report on the current situation

Shown above are the first two paragraphs of the press release by the corporation. Difficulties faced by students in translating this assignment to English were issues of tense and long sentences, which interfered with the full understanding of the passage.

The following is an example of a reference press release released by the European Commission. The form (press release) and substance (establishment of an organization related to smart cities) of the text are quite similar to those of the source text. By comparing the assignment source text and the reference texts in the target language, it becomes apparent that this particular source text generally follows the rhetorical structure of press releases in the target language.

Table 4: Move Observation of Reference Target-language Text (Europa 2012)

Reference Press Release by European Commission	Move observation
BRUSSELS, 10 JULY 2012	Place, Date
Commission launches innovation partnership for Smart Cities and Communities	Title announcing the action to be taken
One of the greatest challenges facing the EU is how best to design and adapt cities into smart intelligent and sustainable environments. Almost three quarters of Europeans live in cities, consuming 70% of the EU's energy. Congestion costs Europe about 1% of its GDP every year; most of it is located in urban areas. Smart urban technologies can make a major contribution to tackling many urban challenges.	Report on the current situation (issues stated)
By launching a Smart Cities and Communities European Innovation Partnership (SCC) the European Commission aims to boost the development of smart technologies in cities – by pooling research resources from energy, transport and ICT and concentrating them on a small number of demonstration projects which will be implemented in partnership with cities. For 2013 alone, €365 million in EU funds have been earmarked for the demonstration of these types of urban technology solutions.	Aim of the action being taken (Solutions to the issues)
Currently many obstacles limit the potential of innovative smart technologies, for example high technological risk, difficulties over uncertain returns on investment or regulatory difficulties. In tough economic times, businesses and cities are also reluctant to scale up and rapidly deploy innovative technologies despite potential cost savings and longer-term emissions reductions.	Difficulties faced
The transport, energy and ICT services and value chains are also now converging. The EU has many years of experience promoting and implementing urban projects in transport, energy and information technology, [sic] those efforts need also to converge to create “new thinking” across sectors.	Call for action

Let us now look at the first move, the title, of the translation text done by students.

Source text:

日立、「スマートシテイ(次世代都市)」の実現に向けた事業統括組織を新設

Student K's translation:

Hitachi Establishes A Business Unit Organization Aiming to the Realization of “Smart City (A Next Generation City)”

Student K's comment written in English:

I wonder how I should choose the tense of the verb “Establish” in headline. According to the text, Hitachi has not established Smart City yet. But they seem to have already decided to work on it. When I checked on some websites that show article headlines, I found “present tense” is often used in these cases. So I wrote it with present tense.

Although the title itself could be made more concise, the headline is shown here to illustrate a point that she was able to notice, the frequently used tense in the headline. Further revision was pointed out to the student by the instructor in the editing of her rewrite.

Student L's 1st draft of the title:

Hitachi to Establish New Committee to Bring Together Group Companies Working For Realization of Smart City (Next-Generation City)

Student L's rewrite:

Hitachi to Establish Smart City Business Management Division

Student L chose to use the phrase pattern of a noun (Hitachi) with *to*-infinitive to describe an event that will take place in the near future. The noun + *to*-infinitive is a frequently used way of mentioning a near-future event in news/press release headlines. Note that she made the title more concise to create more impact as a headline. She commented in English in her rewrite as follows:

Thanks to the discussion we had in class, I could make this translation simpler and easier to understand.

Another difficulty faced in translating this assignment was the long sentences used in the passage. The first paragraph of the source text consists of one long sentence which describes the action to be taken by the corporation and also explains the features of a Smart City. Following the one-sentence source paragraph, Student M used a relative pronoun *which**² to connect the source text information into one sentence in her first draft as shown below. After observing the moves of press releases and having class discussion on the assignment, in her rewrite she used two sentences: one sentence devoted to state the main topic of the press release*⁴ and another, to give the description of a Smart City*⁵.

Student M made another notable change in the rewrite at the beginning part of the paragraph. Although it is an accepted pattern of expression to start out the first sentence using the past tense of the word *announce**¹, the observation of many press releases revealed that the first sentence often states the action that will be taken by an organization or a corporation in the present tense of the verb describing the action. In other words, the sentence pattern of *the subject announced that* is replaced by the pattern of *the subject launches**³ (*verb that describes the action to be taken by the subject*). Student M chose to go with the latter after observing a number of reference press release texts.

Table 5: Comparison of Student M's Translation Texts

Student M's 1st draft:	Student M's Rewrite:
Hitachi Launches Team For A Smart City	Hitachi Launches Smart City Project Headquarters
March 11, 2010 15:51	March 11, 2010 15:51
Hitachi, Ltd. today announced ^{*1} that Hitachi launches Smart City Project Team, supervised by the president, effective April 1, 2010, to promote and extend enterprises aiming to build a next generation city, a smart city, <i>which</i> ^{*2} employs the next generation technology based on smart grids and has highly efficient social infrastructure with less CO2 emission and environmental burden.	Hitachi, Ltd. launches ^{*3} Smart City Project Headquarters, supervised by the president, effective April 1, 2010, to promote and expand business aiming to build the next generation city, the Smart City. ^{*4} By using the next generation technology based on smart grids, the Smart City has highly efficient social infrastructure with less CO2 emissions and environmental burden. ^{*5}

Note: Words or phrases followed by asterisked superscripts (*1 to *5) in the text correspond to the words/phrases in Table 5.

Identifying moves in a source text and a reference target text relevant to the source text in form and/or substance help students make appropriate choices not only for lexical and grammatical points but also for rhetorical issues encountered in the translation process.

5.6 Responses to end-of-term questionnaires

At the end of each term, the school conducts a voluntary and anonymous questionnaire. Let us look at two contrasting comments, probably two extremes, for the curriculum, so that we can grasp how they viewed the course. The original comments were in Japanese and have been translated by the authors.

Student N:

Generally, I think that the time (for the instructor) to explain the translation assignment was too short. I had thought that we could learn about grammar and composition in detail, such as articles, word choice (e.g., what English word should be used for a specific Japanese word), sentence structures (e.g., where to cut a long sentence in the source text, whether to use the active or passive voice). The course was not what I had expected.

Student O:

The large amount of homework kept me busy but increased my ability very much. The quality of the assignments is, of course, important, but no one can improve

their ability without dealing with a large quantity of assignments. In this regard, I think that this course makes students study hard. There is no single right answer in translation, which often frustrates me. However, it provided me with an opportunity for really thinking about learning.

Student N was clearly dissatisfied with the course because she expected lecture-style English grammar or composition lessons, which are traditionally provided by the Japanese education system. In such a system, students become dependent on the teachers and expect them to scold them for errors and mistakes and provide the “correct” answers. This, of course, is not what we are trying to do. One of the challenges that we face is the need to further elaborate the curriculum so that students who feel like Student N can learn how to increase their awareness of the need for learner autonomy.

The comment from Student O, on the other hand, expresses exactly what we are aiming for with this workshop-type course in which we use the OCHA approach to stimulate the development of autonomous, motivated and informed learners. Learner autonomy is indispensable for professional translators in Japan, who often need to deal with texts in a wide variety of genres and fields. Some translators deal exclusively with specific genres in a specific field, such as clinical trial protocols and reports in the pharmaceutical industry, but many translators work in different genres and fields on a weekly or daily basis. Independent learners need to be motivated to continue their learning endeavors and also need to be well informed about the tools and resources available to them. The genre-based approach proposed here provides motivated learners with the ESP concepts of discourse community and genre on which to firmly base their endeavors as well as the genre analysis and corpus linguistics tools with which they can continue their learning development.

6 Future perspectives

This chapter has described an ESP genre-based model of translation for non-literary informative texts. The argument is made for the use of Japanese speakers with a good command of English to fill the need for the translation of informative texts as there is usually not a sufficient number of native English speakers with adequate reading ability as well as systemic literacy of Japanese language, culture, and society to handle such translations.

This genre-based model is founded on theories of language usage in the professions where discourse communities actively construct knowledge via information exchange using genre texts. These genres display distinct features that can be observed and classified to develop hypotheses about the application of such features. For example, as described above, the students made decisions to use the informal,

short versions of the ministerial ordinance names instead of using literal translations of their formal long titles based on their conclusion that it would not be necessary from a communicative viewpoint. Accurate observations of language usage features can be made using corpus linguistics concepts and tools, and text frameworks and repeatedly used expressions can be identified with discourse analysis techniques such as genre analysis. Our translation model incorporating these features can be helpful for making decisions at all levels of translation from the word level to the overall information framework by considering the communicative effect of the target text. The model is not limited to Japanese to English translation and can be particularly useful for translation of languages between which there is considerable linguistic distance. As a robust model, it can be applied to a range of genres and can be used by both native and non-native speakers of the source and target text languages.

To show that the model is a viable one, we have described how it is being used for a translator training course for Japanese speakers working in Japan. Raising awareness of the language features of genre texts is one of the aims in order to help students develop autonomy in making translation decisions through the OCHA process with a PAIL viewpoint. Analysis of the findings showed partial success but also pointed to the need to better communicate the overall goals of the approach.

With the ever growing volume of communications today, the need increases for more and better translation from Japanese to English to disseminate knowledge and enable more Japanese professionals to participate in the construction of knowledge at the professional level with people around the world. Further development and dissemination of this ESP genre-based translation model should help respond to this need.

Acknowledgments

We thank the students enrolled in the translator training course for kindly allowing us to collect and analyze their work in order to test and further develop the ESP genre-based translation model.

References

- Alptekin, Cem. 2010. Redefining multicompetence for bilingualism and ELF. *International Journal of Applied Linguistics* 20(1). 95–110.
- Bach, Ngo Xuan, Minh, Nguyen Le and Shimazu, Akira. 2010. Recognition of requisite part and effectuation part in law sentences. *Proceedings of the 16th Natural Language Processing Association*, 35–38.
- Baker, Mona. 1992. *In other words*. London: Routledge.

- Belcher, Diane. 2004. Trends in teaching English for specific purposes. *Annual Review of Applied Linguistics* 24. 165–186.
- Benesch, Sarah. 1999. Rights analysis: Studying power relations in an academic setting. *English for Specific Purposes* 18(4). 313–327.
- Berkenkotter, Carol, Huckin, Thomas N. and Ackerman, John. 1991. Social context and socially constructed texts: The initiation of a graduate student into a writing research community. In Charles Bazerman and James Paradis (eds.), *Textual dynamics in the professions*, 191–215. Madison: University of Wisconsin Press.
- Best, Ernest. 1978. *From text to sermon: Responsible use of the New Testament in preaching*. Scotland: T & T Clark Ltd. <http://books.google.co.jp/books?id=ZWkpRWUUsf0C&pg=PA33&lpg=PA33&dq=Jesus+lamb+of+god+Inuit&source=bl&ots=8q65nzjlkw&sig=doEajCL-8G9OLHjR1-wl0eUJT50&hl=ja#v=onepage&q=Jesus%20lamb%20of%20god%20Inuit&f=false> (accessed 15 September 2012).
- Bhatia, Vijay K. 1993. *Analysing genre: Language use in professional settings*. London and New York: Longman.
- Bizzell, Patricia. 1982. Cognition, convention, and certainty: What we need to know about writing. *Pre/Text* 3, no. 3:213–43. Reprinted in Patricia Bizzell 1992 *Academic discourse and critical consciousness* (p. 75–104) Pittsburgh and London: University of Pittsburgh Press.
- Bizzell, Patricia. 1992. *Academic discourse and critical consciousness*. Pittsburgh and London: University of Pittsburgh Press.
- Brown, John S. 2008. Foreword: Creating a culture of learning. In Toru Iiyoshi and M.S.V. Kumar (eds), *Opening up education: The collective advancement of education through open technology, open content, and open knowledge*, xi–xvii. Cambridge, MA: MIT Press.
- Buhler, Karl. 1934/1984. *Sprachtheorie. Die Darstellungsfunktion der Sprache*. Stuttgart/New York: Fischer. Cited in Newmark. 2003. In Gunilla Anderman and Margaret Rogers (eds.), *Translation today: Trends and perspectives*, 55–67. Clevedon: Multilingual Matters.
- Collins, Henry M. 1982. Tacit knowledge and scientific networks. In Barry Barnes and David Edge (eds.), *Science in context: Readings in the sociology of science*, 44–64. Milton Keynes, UK: The Open University Press.
- Cortes, Viviana. 2004. Lexical bundles in published and student disciplinary writing: Examples from history and biology. *English for Specific Purposes* 23(4). 397–423.
- Cortes, Viviana. 2006. Teaching lexical bundles in the disciplines: An example from a writing intensive history class. *Linguistics and Education* 17(4). 391–406.
- Ellis, Steve. 1994. *Dante's Hell* (tr.) London: Chatto & Windus.
- Europa. 2012. Commission launches innovation partnership for Smart Cities and Communities. Retrieved from http://europa.eu/rapid/press-release_IP-12-760_en.htm.
- Francis, Gill, Hunston, Susan, and Manning, Elizabeth. 1996. *Collins COBUILD Grammar Patterns 1: Verbs*. New York: HarperCollins.
- Francis, Gill, Hunston, Susan, and Manning, Elizabeth. 1997. *Collins COBUILD Grammar Patterns 2: Nouns and Adjectives*. New York: HarperCollins.
- Google. (2013). Webmaster tools. Retrieved from <http://support.google.com/webmasters/bin/answer.py?hl=en&answer=35769>
- Grabe, William. 2009. *Reading in a second language: Moving from theory to practice*. Cambridge, UK: Cambridge University Press.
- Graddol, David. 2003. The decline of the native speaker. In Gunilla Anderman and Margaret Rogers (eds.), *Translation today: Trends and perspectives*, 152–167. Clevedon: Multilingual Matters.
- Halliday, Michael A.K. 1978. *Language as social semiotic: The social interpretation of language and meaning*. London: Edward Arnold.

- Halliday, Michael A. K. 1992. How do you mean?. In Martin Davies and Louise Ravelli (eds.), *Advances in systemic linguistics: Recent theory and practice*, 20–35. London and New York: Pinter Publishers.
- Hitachi, Ltd. 1994, 2013. Jigyō tōkatsu soshiki no shinsetsu [New organization to be established]. Retrieved from <http://www.hitachi.co.jp/New/cnews/month/2010/03/0311g.html>
- Hunston, Susan. 2002. *Corpora in applied linguistics*. Cambridge, UK: Cambridge University Press.
- House, Juliane. 2003. English as Lingua Franca and its influence on discourse norms in other languages. In Gunilla Anderman and Margaret Rogers (eds.), *Translation today: Trends and perspectives*, 168–179. Clevedon: Multilingual Matters.
- Hyland, Ken. 2001. Bringing in the reader: Addressee features in academic writing. *Written Communication* 18(4). 549–574.
- Hyland, Ken. 2003. Genre-based pedagogies: A social response to process. *Journal of Second Language Writing* 12(1). 17–29.
- Hyland, Ken. 2008. As can be seen: Lexical bundles and disciplinary variation. *English for Specific Purposes* 27(1). 4–21.
- Institute of Translation & Interpreting (no date) *Code of professional conduct* [http://www.iti.org.uk/pdfs/newPDF/20FHConductIn_\(06-11\).pdf](http://www.iti.org.uk/pdfs/newPDF/20FHConductIn_(06-11).pdf) (accessed 15 September 2012)
- Johns, Tim. 1986. Micro-concord: A language learner's research tool. *System* 14(2), 151–162.
- Kuhn, Thomas S. 1962. *The structure of scientific revolutions*. Chicago: University of Chicago Press.
- Lave, Jean and Wenger, Etienne. 1991. *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.
- Leckie-Tarry, Helen. 1995. In David Birch (ed.), *Language and context: A functional linguistic theory of register*. London and New York: Pinter
- Martin, James R. 1984. Language, register and genre. In F. Christie (ed.), *Language studies: children's writing: A reader*. Geelong: Deakin University Press.
- Master, Peter. 1998. Positive and negative aspects of the dominance of English. *TESOL Quarterly* 32(4). 716–725.
- Misaki, Atsuko, Terui, Masako, Miyanaga, Shoji and Noguchi, Judy. 2011, August. A genre-analysis approach to Japanese-to-English translation for a professional training course. Paper presented at the AILA 16th World Congress of Applied Linguistics, Beijing Foreign Studies University. 23–28 August.
- Ministry of the Environment, Japan. Yakushima Ecotourism Guidebook. Retrieved from <http://www.env.go.jp/park/kirishima/data/files/yakushima10.pdf>
- Miyanaga, Shoji, Misaki, Atsuko, Terui, Masako and Noguchi, Judy. 2012. A genre-based approach to translator training in Japan. Paper presented at the 3rd Conference of the Asia-Pacific LSP and Professional Communication Association, University of Southern California, 13–15 March.
- Montgomery, Scott L. 2000. *Science in translation: Movements of knowledge through cultures and time*. Chicago: University of Chicago Press.
- Nakane, Chie. 1970. *Japanese society*. Berkeley and Los Angeles: University of California Press.
- Neubert, Albrecht. 2003. Some of Peter Newmark's translation categories revisited. In Gunilla Anderman and Margaret Rogers (eds.), *Translation today: Trends and perspectives*, 68–75. Clevedon: Multilingual Matters.
- Newmark, Peter. 2003. No global communication without translation. In Gunilla Anderman and Margaret Rogers (eds.), *Translation today: Trends and perspectives*, 55–67. Clevedon: Multilingual Matters.
- Noguchi, Judy. 1997. Materials development for English for specific purposes: Applying genre analysis to EFL pedagogy. *English Teaching* 52(3). 303–318.
- Noguchi, Judy. 2003. Teaching ESP writing: OCHA in a CALL class. *Cybermedia Forum* 4. <http://www.cmc.osaka-u.ac.jp/j/publication/for-2003/index.html> (accessed 15 September 2012)
- Noguchi, Judy. 2006. *The science review article: An opportune genre in the construction of science*. Bern: Peter Lang.

- Paltridge, Brian. 1996. Genre, text type, and the language learning classroom. *ELT Journal* 50(3). 237–243.
- Pezzini, Ornella Ines. 2008. Genre analysis and translation – An investigation of abstracts of research articles in two languages. *Journal Universidade Federal de Santa Catarina, Brazil*. 75–108.
- Price, Derek John de Solla. 1963. Little science, big science. New York: Columbia University Press. In Henry M. Collins (1982) *Tacit knowledge and scientific networks*. (Cited in Barry Barnes and David Edge (eds.), *Science in context: Readings in the sociology of science*, 44–64. Milton Keynes, UK: The Open University Press.)
- Sato, Hiroaki. 1995. *One hundred frogs: From Matsuo Basho to Allen Ginsberg* Shambala Publications: Boston.
- Schäffner, Christina. 2000. Discourse analysis for translation and translator training: Status, needs, methods. *Current Issues in Language & Society* 7(3). 177–184.
- Simple English Wikipedia. http://simple.wikipedia.org/wiki/Main_Page (accessed 15 September 2012)
- Sisler, David. 1994. Your greatest disappointment: Not for Sunday only. *The Augusta Chronicle* 7/2/94. <http://davidsisler.com/7-2-94.htm> (accessed 15 September 2012)
- Stevens, Reed, O'Connor, Kevin, Garrison, Lari, Jocus, Andrew and Amos, Daniel M. 2008. Becoming an Engineer: Toward a Three Dimensional View of Engineering Learning. *Journal of Engineering Education* 97(3). 355–368.
- Swales, John M. 1990a. Discourse analysis in professional contexts. *Annual Review of Applied Linguistics* 11. 103–114.
- Swales, John M. 1990b. *Genre analysis: English in academic and research settings*. Cambridge, UK: Cambridge University Press.
- Swales, John and Feak, Christine B. 1994. *Academic writing for graduate students*. Ann Arbor: The University of Michigan Press.
- Terui, Masako, Miyanaga, Shoji, Misaki, Atsuko, Nishino, Junko and Noguchi, Judy. 2007. Case report of a Japanese-to-English translators' workshop using an ESP approach. Paper presented at the Symposium of Second Language Writing, Nagoya Gakuin University, 15-17 September.
- Thomson, Ian. 2002. The trump and the rump. *The Guardian*, Saturday 21 December 2002. <http://www.guardian.co.uk/books/2002/dec/21/featuresreviews.guardianreview10> (accessed 15 September 2012)
- Trosborg, Anna. 1997a. Text typology: Register, genre and text type. In Anna Trosborg (ed.), *Text typology and translation*, 3–23. Amsterdam and Philadelphia: Benjamins.
- Trosborg, Anna (ed.). 1997b. *Text typology and translation*. Amsterdam and Philadelphia: Benjamins.
- Trosborg, Anna (ed.) 2000. *Analysing professional genres*. Amsterdam and Philadelphia: Benjamins.
- Vintar, Špela. 2008. Corpora in translation: A Slovene perspective. *The Journal of Specialised Translation* 10. 40–55.
- Voice of America Learning English. <http://learningenglish.voanews.com/> (accessed 15 September 2012).
- Young, George Jr. 1995. In Hiroaki Sato (ed.), *One hundred frogs: From Matsuo Basho to Allen Ginsberg*. Shambala Publications: Boston.

Yoko Hasegawa

16 Translation: A theoretical perspective

1 What is translation?

The term *translation* is commonly understood as transformation of a text written in one language into an “equivalent” text in a different language, while retaining the meaning and function of the original text (Catford 1965: 20). The original text is called a *source text* (ST), and the product of a translation is called a *target text* (TT). This seemingly straightforward and common-sense definition immediately begs the essential and thorny question as to what counts as equivalence. If one translates a text from a source language (SL) into a target language (TL), they are necessarily different in form, but they are also expected to be equivalent in some significant sense. In what way and to what extent must they be alike in order to qualify as translation? Halliday, McIntosh, and Strevens (1965: 124) contend that “Are these two texts translational equivalents or not?” is not the right question to work on; instead, one should ask “How far apart are these as translations?” The threshold of acceptability is normally agreed upon according to such factors as the text type, the target audience, and the purpose of the translation.

Jakobson (2000 [1959]: 114) uses the term *translation* in a broader sense, including paraphrasing within a single language (*intralingual translation*) as well as transformation between different symbolic systems (*intersemiotic translation*), e.g., a novel into a film. The third type is *interlingual translation*, i.e., translation between two different languages. It is this sense that is commonly conveyed by the term *translation*. Translating an ancient text into the modern version of the language could be classified as either intralingual or interlingual translation.

Naturally, when the SL and TL are structurally and culturally very different, as in Japanese and English, many adjustments are essential in the translation process – from word selection even to reorganization of the text itself. This chapter discusses issues routinely involved in Japanese-to-English and/or English-to-Japanese translation. It is illustrated with examples, many of which are derived from published translations. Also provided are common techniques often used to cope with such problematic cases.

2 What is translatable?

Some researchers (e.g., Toyama 1987; Wierzbicka 1992) believe that there are ideas that can be expressed in one language but cannot be conveyed without additions and subtractions in another language because languages involve “different conceptual universes” (Wierzbicka 1992: 20). All texts belong to “a dynamic cultural and

linguistic ecology” (Neubert and Shreve 1992: 1). Therefore, translation can be a daunting task of pulling a text from its natural surroundings and recreating it in an alien linguistic and cultural setting. Consequently, translation can sometimes be seen as an act of violence perpetrated against the ST and its culture, epitomized in the old Italian proverb, *Traduttore, Traditore!* ‘Translator, you are a traitor!’

When considering translatability, we need to ask: Do thoughts exist that are expressible only in a certain language? If it is agreed that the meaning of some form can essentially be expressed by some other form within a single language (intra-lingual translation), then the cognitive function of language is not totally dependent on the form. If we can distinguish between thought and form, then it becomes difficult to maintain the argument that certain meanings can be expressed only in a certain language. When there are deficiencies in their inventories of forms, languages can always enrich their lexicons by means of borrowing and coining new words. On the other hand, if paraphrasing is impossible or significantly distorts the original text – e.g., poetry, song lyrics, advertising, punning – it is likely that translation to another language is also impossible. Of course, the content can never be completely detached from the form, and form is nothing without content. While the content of a ST may be translatable, its form often may not be. Therefore, when form makes a significant contribution to the overall meaning of the text, the limit of translatability is approached.

This point can be illustrated by translation of *haiku* poems, which consist of three verses of five, seven, and five moras (\approx syllables). *Haiku* is deeply rooted in traditional Japanese views of nature and its four transient seasons. Therefore, many Japanese believe that *haiku* cannot be truly appreciated by non-Japanese persons whose environs do not have seasonal changes or who do not share the same nature sensibility. Nevertheless, Ueda (2000) reports that many collections of *haiku* translations have been published and well received in the West. The meanings of literary pieces are to a great extent created by their readers. Therefore, it is to be expected that those pieces are interpreted, and in turn translated, differently when readers have different cultural backgrounds.

Ueda discusses one of Matsuo Bashō’s *haiku* that is often negatively criticized by Japanese critics for its impassiveness.

- (1) *Yagate sinu kesiki wa mie-zu semi no koe*
 soon die sign TOP see-not cicada GEN voice
 ‘Nothing in the voice of the cicada intimates how soon it will die’

(trans. by J. D. Salinger)

Salinger presents his translation of this *haiku* in his short story *Teddy* (1953), as a favorite poem of the ten-year-old protagonist, who considers Western poetry to be overly sentimental. Teddy likes this *haiku* because there is little emotion in it. Although Salinger’s translation generates an image that differs from that of the original, it is nevertheless one of many legitimate interpretations and translations.

3 Translation techniques

Vinay and Darbelnet (1995 [1958]) suggest seven translation techniques, each of which is explained below.

3.1 Borrowing

Borrowing (loan words) to deal with the lack of a close equivalent in the TL is the simplest translation technique. Loan words are particularly prominent in English-to-Japanese translation in such technical fields as computers, pharmaceuticals, and telecommunications. For example, (2a) can be translated into Japanese as (2b), in which the underlined words are borrowings.

- (2) a. Antimalware apps scan for viruses, spyware, and other malware trying to get into your email, operating system, or files.
- b. Maru-uea taisaku apuri wa, densi meeru,
 malware countermeasure application TOP electronic mail
opereetyingu sisutemu, mata.wa fairu o kansen.saseru
 operating system or file ACC infect
uirusu, supai-uea, sono.ta.no maru-uea o sukyan.simasu.
 virus spyware other malware ACC scan

3.2 Calque

A *calque* (loan translation) is a special kind of borrowing whereby elements of an expression in the SL are translated literally into the TL (normally into noun phrases), e.g., (English to Japanese) electric chair → *denki* ‘electric’ + *isu* ‘chair’; Fifth Street → *goban* ‘fifth’ + *gai* ‘street’; Salvation Army → *kyuusei* ‘salvation’ + *gun* ‘army’; (Japanese to English) *aki* ‘autumn’ + *maturi* ‘festival’ → autumn festival; *gyuu* ‘beef’ + *don* ‘bowl’ → beef bowl; *koosyuu* ‘public’ + *yokuzyoo* ‘bath’ → public bath.

3.3 Literal translation

Literal translation is item-for-item replacement of words, following closely the SL syntax. It is more frequently used between languages with common ancestry than between unrelated languages like English and Japanese. Nevertheless, it can sometimes be useful for the reader to understand the structure of the ST, as in the study of a foreign language. An example in English-to-Japanese translation is:

- (3) a. the book that I wrote
- b. *watasi ga kaita tokoro no hon*
 I NOM wrote place GEN book

Historically, Japanese did not have a relative pronoun; however, in order to reflect the relative clause constructions of Western languages, the word *tokoro* ‘place’ is inserted, resulting in a syntactic change in the Japanese language.

3.4 Transposition

Transposition involves rendering of a ST while using TL expressions that are semantically, but not formally, equivalent. This strategy is particularly significant in translation between English and Japanese. For example, many scholars contend that Japanese favors verbal constructions, whereas English tends to prefer nominal constructions with *abstract nouns*.

- (4) a. If the long term interest rate continues to fall, the profit margins of bank loans will shrink markedly. (verbal construction)
- b. The continuous decline in the long term interest rate will cause the profit margins of bank loans to shrink markedly. (nominal construction)

English is equipped with a rich repertoire of abstract nouns, and they are frequently used, most notably as the subjects of clauses. By contrast, Japanese does not get along well with abstract nouns. In fact, Japanese has far fewer abstract nouns than does English, and to a surprising degree. Ōno (1978: 55–62) reports that even abstract nouns for such basic concepts as *right* and *wrong* did not exist in Old Japanese, although it is difficult to imagine that ancient people lacked these concepts. In order to express them, *zen* ‘good/right’ and *aku* ‘bad/evil’ were borrowed from Chinese.

In the 1930s, a silent movie, *Nani ga kanozyo o soo saseta ka* ‘What made her do it’, created a sensation at the Japanese box-office. This success was reportedly due in great part to its linguistically eccentric title: it used familiar vocabulary and familiar grammatical structure, but it juxtaposed an abstract subject (*nani* ‘what’) to the causative predicate (*saseta* ‘made someone do’), which just did not happen in normal Japanese. Even today, after decades of noticeable rhetorical-style changes influenced mostly by English, this type of sentence continues to sound peculiar to Japanese ears. (See Hasegawa 2011 for further discussion and examples.)

3.5 Modulation

Modulation is a variation of the form of the message, accomplished by changing the point of view. For example, *gozitu-hikikae-ken* ‘ticket for a later day’ ↔ rain check; *kin’en* ‘smoking prohibited’ ↔ no smoking; *mansitu* ‘all rooms full’ ↔ no vacancy; *okosanaide kudasai* ‘please do not wake me up’ ↔ don’t disturb; *penki nuritate* ‘just painted’ ↔ wet paint.

This is the technique Edward Seidensticker employed in his translation (Kawabata 1981) of the opening passage of KAWABATA Yasunari’s 1937 novel *Yukiguni* (*Snow country*).

- (5) *Kokkyoo no nagai tonneru o nukeru to yukiguni de.atta.*
 border GEN long tunnel ACC pass when snow.country was
 ‘The train came out of the long tunnel into the snow country.’

The use of *come* in Seidensticker’s translation indicates that the narrator, who is supposed to be located in snow country, observed the train coming out of the tunnel. In contrast, the narrator of the original text was inside the train and discovered that he was in the snow country when the train had passed through the tunnel.

3.6 Equivalence

Equivalence refers to the strategy that creates equivalent texts by using structural or stylistic methods that differ from those used in the ST. For example, greetings and situational expressions are normally replaced with their functional equivalents. Some examples are *atarii!* ‘correct’ ↔ bingo!; *ogenki desu ka* ‘are you healthy?’ ↔ how have you been?; *odaizi ni* ‘take (yourself) important’ ↔ take good care of yourself; *yare-yare* ↔ whew; *zya mata* ‘then again’ ↔ bye.

Idioms, clichés, proverbs, and the like are replaced with semantically equivalent expressions, e.g., *abura o uru* ‘to sell oil’ ↔ to waste time; *asa-mesi mae* ‘before breakfast’ ↔ a piece of cake; *siranu ga hotoke* ‘if you’re ignorant, you can live like a Buddha’ ↔ ignorance is bliss; *sita e mo okanu motenasi* ‘a treatment in which you’re not even placed on the ground’ ↔ red-carpet treatment; *tagui mare-na* ‘a similar kind can hardly be found’ ↔ unparalleled/once in a blue moon.

3.7 Adaptation

Adaptation is used when the type of situation in the ST is totally unknown in or strange to the target culture. If an explanation is inevitably too long, a similar but different situation must be substituted for it. Examples in English-to-Japanese translation are Bat/Bar Mitzvah (girls/boys taking at twelve/thirteen years of age) →

seizin-siki ‘a coming-of-age ceremony’ (twenty years of age); indentured servant → *detti* ‘an apprenticed boy.’ Those from Japanese-to-English are *booze atama* ‘monk’s head’ → a shaved head; *omikuji* ‘one’s fortune drawn by lot’ → an oracle; *tokonoma* ‘a built-in recessed space in a Japanese style room’ → alcove.

3.8 Omission

Although it is not included in Vinay and Darbelnet’s (1995) list of strategies, under certain circumstances, deliberate *omission* of a sentence or sentence part in the ST can be a feasible translation technique. For example, the ST might be exceedingly repetitious, or information conveyed is well-known by the target audience or judged not vital but rather distracting. If the target audience is American, and the ST in Japanese explains the grading system of American colleges, translating that portion in detail is pointless.

4 Information addition, deletion, and offsetting

When the ST contains culturally bound information, translation loss is inevitable unless missing background information is supplied. Decisions as to whether or not to provide such information and how much of it to provide must be based on the nature of the ST, target readership, and the translation purpose. For instance, in the following translation from Japanese, the ST does not explain who HIGUCHI Ichiyō, Jingū Kōgō, and Murasaki Shikibu were; however, if not explained in the TT (the underlined parts), they mean nothing to most English-speaking readers.

The first woman whose portrait was featured on the front of Bank of Japan notes was HIGUCHI Ichiyō (1872–1896), a Meiji-period novelist who focused on the lives of poor women, including those who worked in the pleasure quarters. During the Meiji period, however, one of the national banks issued a note with a portrait of Empress Jingū (c. AD 169–269), a legendary figure whose portrait was drawn from imagination. Currently, the verso of the 2,000-yen note features Murasaki Shikibu (c. 978–1014), a lady of the court who wrote the famous early-eleventh-century novel, *The Tale of Genji*.

When some information is lost in one place in a translation, it can be compensated for in another location. For example, a Japanese utterance using the addressee’s name with *-tyan* (a hypocoristic suffix) might be rendered in English by an informal speech style or use of a nickname.

5 Contrastive rhetoric

The norms of rhetorical structures vary considerably from one language to another. Crosslinguistic investigation of rhetorical styles is referred to as *Contrastive Rhetoric*. If translators, unaware of such fundamental differences, transfer their assumptions about English organizational patterns to Japanese text, or vice versa, their interpretations of the ST can be distorted.

5.1 Text organization

In Japanese writing, the primary idea often appears in the middle of the discourse, rather than at the beginning. Hinds (1990) contends that English-speaking readers normally expect that a text is organized in the *deductive style*, in which the thesis statement appears at the beginning. If they do not find it at the beginning, they then assume that the text is arranged in the *inductive style*, in which the thesis statement appears in the final position. By contrast, Hinds found that in East Asian writing styles, the thesis statement is typically buried within the passage, with the topic often implied but not explicitly stated. This style is encouraged in Asian societies because a writing style that is too explicit is not respected, or may even offend.

Riggs (1991) asserts that Japanese essays and magazine articles, written for a small and relatively homogeneous readership, are frequently organized loosely and may need to be reorganized into English texts that are comprehensible to a highly heterogeneous international readership. When one translates such a ST faithfully, the first draft may have no opening paragraph to present the argument, few or no transitions among sentences or paragraphs, and often no conclusion. The translation, then, needs to be altered by supplying the missing elements and restructuring the TT to suit English expository conventions.

5.2 Paragraphs

Between English and Japanese, a frequently called for adjustment concerns paragraph breaks. Compared to Japanese, English prose has significantly fewer breaks; conversely, Japanese writing utilizes frequent line breaks. One may even encounter Japanese texts that place a line break after every period. This phenomenon is due to the fact that the concept of paragraph has not been clearly established in Japanese writing (Hōjō 2004: 41).

Having examined each of seven English-to-Japanese and seven Japanese-to-English translations in regard to paragraphing, I was able to confirm that breaks are maintained in English-to-Japanese translation, whereas they are likely to be changed in Japanese-to-English translation. Moreover, when paragraphs are adjusted,

English TTs invariably have fewer paragraphs than the Japanese STs (Hasegawa 2011: 186–187).

5.3 Verbiage

Verbiage, or verbosity, means overabundance of words. Nida (1964: 126) asserts that in order to guarantee efficiency of communication against distortion by noise or other incidental factors, languages tend to be redundant, both syntactically and semantically. The amount of redundancy differs from language to language, but Nida conjectures that it is normally somewhere around 50 percent. Japanese is more tolerant of verbosity than is English (Terry 1985; Wakabayashi 1990). For example, Japanese accepts word repetition to a great extent, but English does not accommodate excessive repetition, so that rewording of the text may be necessary, utilizing synonyms or paraphrases, e.g., *Capitol, White House, Washington* for the *United States government*. As a consequence, repetition does not have the same significance in the two languages. In English, it may be interpreted as the writer's lack of skill, whereas in Japanese it normally conveys a "reassuring continuity" (Wakabayashi 1990: 60). On the other hand, while English allows repetition as an intensifier, such repetition in Japanese diminishes the significance, as exemplified by (6b), or even results in absurdity, exemplified by (6c) cited in Kōno (1975: 121):

- (6) a. But O heart! heart! heart! (Walt Whitman, *O captain! My captain!*)
 b. *Daga, oo, kokoro.yo! kokoro.yo! kokoro.yo!* (my translation)
 but oh heart (vocative)
 c. *Daga, oo, sinzoo! sinzoo! sinzoo!*
 but oh heart

Seidensticker and Anzai (1983: 106) provide excellent examples of high tolerance of verbiage in Japanese prose. (7a) is my attempt to translate one of the passages as closely as possible to the original wording, whereas (7b) is its revision containing little redundancy and sounding more natural as an English text.

- (7) a. Now, if the actor (an entity following *by*) is frequently not overtly present in the passive voice, it, in turn and said conversely, indicates that the passive voice is a convenient means when the actor is unknown, uncertain, or to be deliberately effaced. If we go one step further along this line of thinking, the passive voice can be said to treat a certain action not as an intentional *act*, but, rather, objectively and indirectly as an *event*. (78 words)

- b. The fact that the actor (an entity following *by*) is frequently not overtly present in the passive voice indicates that the passive voice is a convenient means when the actor is unknown, uncertain, or to be deliberately effaced. In other words, the passive voice treats a certain action not as an intentional *act*, but, rather, objectively as an *event*. (59 words)

5.4 Phaticity

Phaticity is a function of language that serves to establish and maintain a feeling of solidarity among interlocutors by dealing with emotions and attitudes in communication (Malinowski 1999 [1923]). The primary function of many fixed expressions – e.g., *How are you?*, *Yours truly* – is phatic communication, rather than seeking information or conveying ideas. Other phatic expressions include *of course*, *naturally*, *undoubtedly*, *as you may know*. Phaticism is significantly more common in Japanese texts than those in English; therefore, the translator may need to tone down or even entirely omit the phatic portion. Compare the following English translations, whose ST contains such phatic expressions as *sen'etu nagara* 'although presumptuous', *gosyuuti no toori* 'as you know', *yahari* 'as expected' and a rhetorical question. Just eliminating these expressions makes the translation more idiomatic.

- (8) It may sound presumptuous, but I'd like to make a suggestion regarding the newly installed bench in the park. As you all know, the purposes of the park are to enrich the town's amenities and to provide residents with an opportunity to interact with nature. Therefore, as we naturally expect, isn't it unsuitable to place advertisements and posters on the bench?

Rhetorical questions are very frequently used by Japanese writers in order to achieve rapport with the reader. Although the rhetorical questioning is also available in English, the frequency of its occurrence is drastically different. Terry (1985) argues that rhetorical questions are didactic, and that English readers may feel they are being talked down to when such questions are posed.

6 Translation studies

The academic discipline that investigates issues involved in the practice of translation is called *Translation Studies*. It covers the gamut of professional and/or academic concerns, including description of the phenomenon of translating, development of theoretical frameworks and assessment criteria, individual case studies, training translators, and the history of translation practices in various parts of the world.

Translation Studies as an independent academic discipline had become solidly established by the mid-1990s. Although Translation Studies itself is young, discussions on translation and translating go far back in recorded history. For excellent overviews of relevant literature in Translation Studies, see Munday (2001).

6.1 Premodern translation theories

The question that learners of translation most frequently raise is: How intensely should one adhere to the ST diction (i.e., wording)? Or, conversely: How much freedom can a translator assume in his/her practice of translation? For about two thousand years after Cicero's work in the first century BC (Cicero 1960 [46 BC]), discussions of translation were mainly limited to the dichotomy of word and sense. Scholars argued whether translations should consist of rendering *word-for-word* (i.e., literal or faithful translation) or *sense-for-sense* (i.e., "free" translation), with prevailing opinion swinging from one side to the other (Snell-Hornby 1995 [1988]: 9). In classical times, it was the norm for translators working from Greek to provide a word-for-word rendering which would serve as an aid to readers of Latin who were reasonably acquainted with the Greek language (Hatim and Munday 2004: 11).

In the seventeenth century, English poet and critic John Dryden (1631–1700) categorized translations into the following three types (Dryden 1992 [1680]: 17):

- (9) a. *Metaphrase*: "turning an author word by word, and line by line, from one language into another."
- b. *Paraphrase*: "translation with latitude, where the author is kept in view by the translator, so as never to be lost, but his words are not so strictly followed as his sense; and that too is admitted to be amplified, but not altered."
- c. *Imitation*: "the translator [...] assumes the liberty, not only to vary from the words and sense, but to forsake them both as he sees occasion; and taking only some general hints from the original [...] as he pleases."

Dryden considered paraphrase the appropriate mode of translation, and he advocated creation of a TT that the original author would have written had s/he known the TL.

In the early nineteenth century, the German theologian, philosopher, and translator, Friedrich Schleiermacher (1768–1834) wrote the much-quoted treatise, *On the different methods of translating*. In it he moved beyond the discussion of traditional word-for-word vs. sense-for-sense dichotomy. Considering ways to bring the ST writer and the TT reader together, he contended that there are only two possibilities: "Either the translator leaves the writer alone as much as possible and moves the reader toward the writer, or he leaves the reader alone as much as possible and moves the writer toward the reader" (Schleiermacher 1992 [1813]: 42).

Schleiermacher called the first method *alienation* and the latter *naturalization*. He contended that the perfect translation in the first case – leaving the writer alone as much as possible and moving the reader toward the writer – would be such that, had the author learned the TL, s/he would have translated the ST in the same way. In the second case – leaving the reader alone as much as possible and moving the writer toward the reader – the ideal would be such that, had the author originally written the text in the TL, s/he would have written it in the same way. In alienation translation, the author, who is also the translator, understands the text perfectly, but because s/he is not a native speaker of the TL, the TT retains an aspect of foreignness. On the other hand, in Schleiermacher's framework, Dryden's approach would be characterized as a case of naturalization, moving the author toward the reader. Schleiermacher favored alienation. That is, the translator should communicate to the reader the images or impressions of the original work gained by virtue of knowledge of the SL, and furthermore, put the reader in the translator's perspective, which is foreign to the reader.

In the eighteenth century, fluent translation was the norm. But the pendulum appears to have begun to swing in the other direction, at least in Translation Studies. By the end of the twentieth century, taking the reader to the original writer had become common-place. In this view, "translation ideally opens a window on to something different, enriching the language and culture with foreign elements" (France 2000: 5).

The alienation method was taken up later by Venuti (1995: 305–306) as *foreignization*, and the naturalization method as *domestication*. The foreignization style of translation renders the text in ways that may seem unnatural or strange in order to highlight the original characteristics of the ST, and as a way of resisting the dominance of the target culture. We tend to believe that translations should read naturally and smoothly, as if the original author were a native speaker of (a contemporary version of) the TL. However, the original author is normally not a native speaker of the TL, so s/he may express ideas in a way that native speakers of the TL never would.

6.2 Mid-twentieth century translation theories

The 1940s–1960s were the decades when researchers began to analyze translation more systematically and to apply theories developed in Linguistics. During this period, many academic disciplines outside the natural sciences and engineering were redefined; in order to gain legitimacy as modern academic disciplines, they had to be "scientific," and Translation Studies reflected this intellectual climate.

The key issue during this period was *equivalence*. Previously, opinions differed as to what should be equivalent, whether words or something smaller or larger than words would suffice. "Gradually the concept of the translation unit emerged,

which lies between the level of the word and the sentence” (Snell-Hornby 1995: 16). The text was seen as a linear sequence of units, and translation was perceived as a *transcoding* process (i.e., the conversion of one code system to another), substituting equivalent units.

Nida (1964) and Nida and Taber (1969) attempted to make translation more “scientific” by incorporating concepts and terminology from the then-prevailing theory of *Classical Transformational Grammar*, which consists of a set of rules that generate all and only well-formed sentences of a language (Chomsky 1957, 1965). The theory posits two levels of representation: a *deep structure* and a *surface structure*. The deep structure represents the semantic relationships within a sentence, consisting of simple, basic forms (*kernel sentences*); it is then mapped onto the surface structure by *transformational rules*. For example, in those days both *The plan was criticized by some members of Congress* (in the passive voice) and *Did some members of Congress criticize the plan?* (an interrogative sentence) were supposed to be derived from a single kernel sentence, *Some members of Congress criticized the plan*, which is in the active voice and in the declarative form.

In Nida and Taber’s theory, the surface form of the ST should not be translated directly into the TT, but, rather, should first be broken down into kernel sentences, for they were believed to be much more similar across languages than surface forms. The deep structures would then be transferred into corresponding kernel sentences in the TL, and finally, they would be restructured semantically and stylistically into the surface structure of the TL as appropriate for the target audience. Classical Transformational Grammar has long since been superseded by other approaches; however, the technique for breaking down sentences to simpler ones may still be useful when the ST is very complex.

Another influential concept proposed by Nida is the dichotomy of *formal* and *dynamic equivalence*. Nida states:

[Formal equivalence] focuses attention on the message itself, in both form and content. In such a translation one is concerned with such correspondences as poetry to poetry, sentence to sentence, and concept to concept [...] This means, for example, that the message in the receptor culture is constantly compared with the message in the source culture to determine standards of accuracy and correctness. (Nida 1964: 159)

Dynamic equivalence, subsequently re-termed in Nida and Taber (1969) as *functional equivalence*, is based on the principle of *equivalent effect*, i.e., the assumption that the relationship between the TL reader and the TT message should be substantially the same as that between the SL reader and the ST message. For example, in Biblical translation, the *Lamb* in *Lamb of God* symbolizes innocence in the context of sacrifice. Formal equivalence would create problems in Eskimo society, where the lamb does not exist and cannot therefore be symbolic of anything. The dynamic equivalent for Arctic peoples, for whom the seal is naturally associated with innocence, might be the *Seal of God*. Nida (1964: 166) describes a dynamic-equivalence

translation as one about which a bilingual and bicultural person can say, “That is just the way we would say it.”

Partly because Linguistics as a discipline was not well developed at the time, linguistically oriented approaches prior to the 1970s have been criticized as simplistic, prescriptive, and divorced from context, as well as instigating an illusory and deceptive notion of science. In linguistics-oriented studies, translation difficulties were “perceived as essentially formal in nature: lack of equivalence at word level, culture-specific items, difficult syntax, non-matching of grammatical categories such as gender [...]” (Baker 2000: 21). Critics also question how and whether one can expect a TT to elicit the same response as the ST in different cultures and different times. Similarly, whether or not such a goal has been achieved is no more than the subjective judgment of the translator or analyst.

6.3 Skopos Theory

The 1970s and 1980s witnessed a move in Translation Studies from linguistics-oriented to communication-oriented approaches. Snell-Hornby (2006: 49) characterizes this turn as from the “prescriptive, source-text oriented, linguistic and atomistic” to the “descriptive, target-oriented, functional and systemic.” This section introduces one such approach, referred to as the *Skopos Theory*, developed in Germany in the late 1970s by Hans Vermeer (1978) and Katharina Reiß (Reiß and Vermeer 1984).

In the Skopos Theory (derived from the Greek word for *aim* or *purpose*), translation is viewed as a chain of human actions, not as a process of transcoding. A text is seen as an offering of information made by a producer to a recipient. Translation is then characterized as an offering through the TT to members of the target culture of information that is similar to that originally provided through the ST to members in the source culture.

Typically, a translation project begins with an *initiator* who commissions a translation in order to accomplish a particular purpose or function when the TT is read by the target audience. The target audience could be the initiator him/herself who wishes to understand the ST. The intended purpose is called the *skopos* of the translation project. The Skopos Theory considers that what determines an appropriate method and strategy is the *skopos* of translation specified by the initiator, not the ST as such or the function assigned to it by the ST author, nor its effect on the ST audience, as was postulated by the equivalence-based translation theorists (Nord 1991: 39). The initiator’s aim or purpose can be drastically different from that of the original author. For example, the original purpose of Jonathan Swift’s novel, *Gulliver’s travels* (1726), was satire on contemporary social ills, but today, it is translated and read as a fantasy adventure tale (Reiß 2000 [1971]: 162).

Note that scholars have long recognized the significance of the purpose of translation. For example, Nida writes:

The particular purposes of the translator are also important factors in dictating the type of translation. Of course, it is assumed that the translator has purposes generally similar to, or at least compatible with, those of the original author, but this is not necessarily so. [...] the purposes of the translator are the primary ones to be considered in studying the types of translation which result, the principal purposes that underlie the choice of one or another way to render a particular message are important. (Nida 1964: 157)

However, previous theories never considered the presence of the initiator, who plays a pivotal role in Skopos Theory. The initiator expects the translator to produce a TT that conforms to the requirements of his/her skopos. Although the TT need not be a faithful imitation of the ST, fidelity to the ST is one possible aim. In this respect, the Skopos Theory does not differ much from previous theories based on translation equivalence. Furthermore, when members of the target audience receive a TT as a translation of a foreign-language text, they expect a certain resemblance to exist between the two. “This expectation is based on a (culture-specific) concept of translation specifying what kind of relationship should exist between a text that is called a translation and the other text it is said to be a translation of” (Nord 1991: 39). Skopos Theory does not, therefore, unqualifiedly promote free translation.

Deciding what strategies to take, along with determining the possible rearrangement of content, is up to the translator as an expert. The method may be adaptation to the target culture or having the target audience learn about the source culture. No translation is possible without identifying the skopos of the translation, and any ST can be rendered in multiple appropriate translations. Skopos Theory identifies the following five broad translation types (Snell-Hornby 2006: 52–53):

- (10) a. The word-for-word translation as once used by Bible translators in the form of glosses. It reproduces the linear sequence of words, irrespective of any rules (grammatical, stylistic, etc.) of the TL.
- b. The grammar translation as used in foreign language instruction to test knowledge of vocabulary and grammar. The rules of TL syntax are observed, and the linguistic meaning is clear, but normally it is a rendering that is functional only at sentence level, inadequate in a larger context.
- c. The documentary or scholarly translation that reflects Schleiermacher’s maxim of “moving the reader towards the author”. The text is seen in its entirety, but the translation is oriented towards the ST, and it aims at informing the target audience of the content.
- d. The communicative or instrumental translation that is oriented towards the target culture, using its conventions and idioms. The text function typically remains unchanged, and the TT may not be immediately recognizable as a translation.
- e. The adapting or modifying translation, in which the ST functions as raw material serving a particular skopos, as with intersemiotic translation, or when news reports are used by press agencies.

The plausibility of Skopos Theory is clearest in translation of pragmatic texts, as opposed to literary texts. In translation of manuals, for example, the resemblance between the ST and TT is simply irrelevant. As Viaggio (1994: 104) asserts, the reader “wants a manual that will tell him clearly and concisely how to use his gadget. For him, there is only one manual: his, in Spanish; whether or not it happens to be a translation or an adaptation from another language is absolutely immaterial.” In this kind of pragmatic-text translation, nothing is more important than its acceptability in the target culture.

Non-native readers are not the readers intended by the ST author; therefore, STs often include expressions that are likely to be incomprehensible to the target audience. If they play a significant role in the ST, concepts unfamiliar to the target culture must be explained. For instance, the term *kyatti-appu moderu* ‘catch-up model’ is frequently used in writings on the modern Japanese economic situation. Translating it as ‘the catch-up model’ is of little help to the target audience in interpreting the text, whereas ‘the catch-up with the West model’ significantly improves its readability.

It is often said that translators must not change text. But creation of a TT that is not understood by the target audience is futile. When the source and target cultures are drastically different, mere explanation may not help the TT reader, and thus adaptation might be called for. The following is an excerpt from Donald Keene’s translation of DAZAI Osamu’s 1947 novel *Shayō* (*The setting sun*). The story is about the fall of an aristocratic family in postwar Japan. The young woman protagonist and her mother were evacuated from Tokyo during World War II, and the mother became ill. In this text, *sendaihora no hakama* ‘loose-legged pleated trousers for formal wear which are made of high-quality silk manufactured in Sendai’ and *sirotabi* ‘white, heavy-soled socks made with a split in the toe section between the big toe and second toe’ are translated simply as ‘old-fashioned Japanese costume’. When *sirotabi* occurs a second time, Keene uses ‘white gloves’ as a substitute.

Some two hours later my uncle returned with the village doctor. He seemed quite an old man and was dressed in formal, rather old-fashioned Japanese costume. [...] I took the necessary minimum of cooking utensils from our baggage and prepared some rice-gruel. Mother swallowed three spoonfuls, then shook her head. A little before noon the doctor appeared again. This time he was in slightly less formal attire, but he still wore his white gloves.

If, on the other hand, an expression that is unlikely to be understood by the target audience is deemed trivial, adding an explanation will disproportionately highlight the item. Omission is thus an appropriate strategy in such cases. In the following passage derived from OKAMOTO Kanoko’s 1950 novel *Rōgishō* (*Portrait of an old geisha*), a passing reference to *simotaya*, which is a type of residence in a row of commercial establishments, has been omitted in the first translation:

After years of hard work, Kosono had managed to put away a tidy sum. Able for the past ten years or so to pick and choose her engagements, she began to long for a more settled way of life. She divided her living quarters from the geisha house, with a private entrance off the back alley. She adopted a distant relative's child as her daughter and sent her to a finishing school. (trans. by Cody Poulton)

Whether the reference to *simotaya* should be omitted or not is up to the translator. The same passage is translated by Kazuko Sugisaki, which translates *simotaya*:

In the last ten years, after Kosono became comfortably well off and rather free to choose which parties she entertained, she had come to prefer a healthy middle-class lifestyle to her professional one. She had divided her house into two separate sections: one was the geisha house quarter, and the other, her living area, to which a storehouse with traditional whitewashed walls was connected. She built an independent entrance to the living section facing a narrow back street. The entrance suggested the house to be a home with no relation to the front geisha quarter. Kosono also adopted a girl from a distant relative and sent her to high school.

Kern (2000: 114) points out that when non-native readers read a ST, they inevitably bring their own historical, socio-cultural, and personal considerations. The following passage is Alfred Birnbaum's translation of MURAKAMI Haruki's *Hitsuji o meguru bōken* (*A wild sheep chase*): "I walked along the river to its mouth. I sat down on the last fifty yards of beach, and I cried. I never cried so much in my life. I brushed the sand from my trousers and got up, as if I had somewhere to go."

This story is full of numbers, and Birnbaum generally translates them faithfully. However, here, *ni-zikan* 'two hours' in *ni-zikan naita* 'I cried for two hours' is omitted. Hōjō (2004: 9–11) considers this omission to be likely motivated by the cultural differences in which the act of crying is perceived and evaluated. In Japanese culture, crying is generally accepted in a positive light, whereas in English-speaking culture, it is less so. The direct translation here with "two hours" would sound narcissistically positive about the act of crying, which, Hōjō argues, made the translator averse to including the phrase.

6.4 The Negative Analytic

In the 1980s, a view radically different from the Skopos Theory was proposed in literary translation by Antoine Berman (1942–1991), who translated Latin American novels and German philosophical treatises into French. He considered that every translation inevitably involves textual deformation – e.g., "ethnocentric, annexationist translations and hyper textual translations (pastiche, imitation, adaptation, free rewriting), where the play of deforming forces is freely exercised" (Berman 2000 [1985]: 286). He proposed an approach to the study of translation that is referred to as the *Negative Analytic*, a detailed analysis of the deforming system and unconscious deforming tendencies, or forces, present in the system. He identified twelve such tendencies. Below are explanations of four of them: *rationalization*, *clarification*, *expansion*, and *ennoblement*.

6.4.1 Rationalization

Rationalization primarily affects such syntactic structures as punctuation and sentence sequences by rewriting according to the translator's discursive standards. It is also reflected in the tendency for a translator to generalize and to change the text from concrete to abstract, e.g., using abstract nouns instead of verbs. Or, a translator may eliminate a portion of the text as redundant. Such rationalization deforms the ST and is typical of ethnocentric translation (Berman 2000: 289). For example, the order of the parts of the title of MURAKAMI Haruki's novel *Sekai no owari to hādoboirudo wandārando* 'The end of the world and a hard-boiled wonderland' is reversed in Alfred Birnbaum's translation as *Hard-boiled wonderland and the end of the world*. Perhaps it was thought to have a better impact on readers of English than the original order. His translation by omission of "crying for two hours" mentioned above is also an instance of this type of deformation.

6.4.2 Clarification

Clarification, a corollary of rationalization, is inherent in translation; every translation involves some degree of *explicitation*, which is "the process of introducing information into the target language which is present only implicitly in the source language, but which can be derived from the context or the situation" (Vinay and Darbelnet 1995: 8). An excerpt from ARIYOSHI Sawako's 1972 novel *Kōkotsu no hito* (*The twilight years*) and its translation by Mildred Tahara follows. In it, *mayoke* 'a talisman to protect one against evil' is clarified as 'something with a sharp edge to ward off evil spirits' as the underlined:

The Kiharas and Kadotanis arrived. When they realized that Akiko was not doing anything about it, they began preparing for the wake. Both families had experienced the death of a close relative, so Akiko was given an opportunity to learn in detail the traditional Japanese way of caring for the dead. Mrs Kihara came up to Akiko and said, "We'll need a knife, Mrs Tachibana."

"Yes, of course. What are you going to cut?"

"It isn't for cutting anything. We need something with a sharp edge to ward off evil spirits. We're going to put it on the breast of the Buddha [the deceased]."

6.4.3 Expansion

Like other theorists – e.g., Nida and Taber 1969; Steiner 1975; Vinay and Darbelnet 1995; Hatim and Munday 2004 – Berman contends that TTs tend to be longer than STs. This expansion is due in part to rationalization and clarification; thus expansion is a more general term and does not contrast directly with rationalization and clarification. The translator almost inevitably wishes to convey everything that is in the

ST, including those things that remain implicit in it because the ST readers presumably possess all relevant background information, but the TT readers are unlikely to have it. The following is the opening of the March 16, 2004 *Tensei jingo* (Vox populi, vox dei), a daily column that appears on the *Asahi Newspaper* front page, which was translated in *Asahi Weekly*. The underlined parts did not appear in the ST.

Until Monday, it was fun just to imagine marathoner Naoko “Q-chan” Takahashi running through Marathon, the birthplace of the sporting event. In the end, though, she was not selected for the Japanese marathon squad for the Athens Olympics. This got me thinking: Had she been chosen, which of her rivals could the Japan Association of Athletics Federations (JAAF) have dropped? Reiko Tosa? Unlikely. She won her dramatic come-back-from-behind victory in the Nagoya International Marathon last Sunday, marking the fastest time in the four qualifiers. Naoko Sakamoto? Also unlikely. After placing third among all Japanese runners in the World Championships in Paris last August, Sakamoto won the Osaka International Marathon less than six months later. JAAF could not have come up with any persuasive reason for denying either of them an Olympic berth.

Expansion could also be attributed to an “empty” addition that muffles “the work’s own voice” (Berman 2000: 290). This type of negatively-judged expansion is sometimes called *overtranslation*.

6.4.4 Ennoblement

Ennoblement refers to the tendency to produce more elegant language than the original. This procedure is active not only in the literature field, but also in consumer reports, business and advertising, as well as in the sciences, where the ST may need to be “improved” for greater readability by eliminating clumsiness and complexity of the original. The opposite of ennoblement occurs when passages are made too informal or popular, e.g., employing slang. Nida (1964: 169) points out that in avoiding vulgarisms and slang as well as when trying too hard to be completely unambiguous, a translator might end up making a relatively straightforward message in the SL sound like a complex legal document.

Edward Seidensticker’s translation of KAWABATA Yasunari’s *Yukiguni* (*Snow country*) illustrates this tendency:

It had been three hours earlier. In his boredom, Shimamura stared at his left hand as the forefinger bent and unbent. Only this hand seemed to have a vital and immediate memory of the woman he was going to see. The more he tried to call up a clear picture of her, the more his memory failed him, the farther she faded away, leaving him nothing to catch and hold. In the midst of this uncertainty only the one hand, and in particular the forefinger, even now seemed damp from her touch, seemed to be pulling him back to her from afar. Taken with the strangeness of it, he brought the hand to his face, then quickly drew a line across the misted-over window. A woman’s eye floated up before him.

Seidensticker's (1989: 153) commentary on this translation:

There are other matters on which the Japanese express themselves more openly than we are accustomed to: matters of evacuation, for instance. A bowdlerizer [to expurgate a book or writing, by omitting or modifying words or passages considered indelicate or offensive] one may be when one has the hero relieve himself indoors rather than on Main Street, but the alternative is to shock when the original is not at all shocking. I was once accused of bowdlerizing because in a most intimate scene I changed a finger to a hand. I couldn't help it. The finger called up many memories of limericks, a heritage in which my author could not possibly have shared.

6.5 Recent approaches

6.5.1 Cultural communication

In recent years, translation practice has been viewed as the application of a translator's knowledge to problems of *intercultural communication* (e.g., Bell 1991; Snell-Hornby 1991; Neubert and Shreve 1992). *Culture* in this context should be understood in the broader anthropological sense as referring to all socially conditioned aspects of human life. This trend emphasizes that language is not an isolated phenomenon in a vacuum, but an integral part of a culture, and STs are embedded in a complex linguistic, textual, and cultural context in which their meanings, communicative intents, and subsequent effects hold intrinsic relationships.

In translation, communication must take place between the ST writer and the TT reader, i.e., between members of two different cultures. "Successful communication in another language requires shifting frames of reference, shifting norms, shifting assumptions of what can and cannot be said, what has to be explicit and what ought to remain tacit, and so on. In other words, it involves *thinking differently* about language and communication" (Kern 2000: 1). Therefore, in addition to linguistic competence, extensive factual and encyclopedic knowledge, and familiarity with the everyday norms and conventions of both the source and target cultures, translation requires what Kramsch (2006) calls *symbolic competence*, competence in the manipulation of symbolic systems.

Symbolic forms are not merely vocabulary items and communication strategies, but also "embodied experiences, emotional resonances, and moral imaginings" (Kramsch 2006: 251). In recent years, meaning is no longer considered to be enclosed in texts. Rather, meanings are now seen as entities constructed by the reader during the dynamic process of reading and mediated by his/her cognition, culture, and ideology. The ST is not seen as a static specimen of the SL, but as the verbalized expression of the author's intention as understood by the translator (in his/her role as a reader), who, in turn, recreates this whole meaning for another readership in the target culture. This complex process explains why new translations of literary works are constantly in demand, and why some say the perfect translation does not exist.

When the SL and the TL are quite different but their cultures are related and similar, e.g., between Chinese and Japanese, the translator needs to make many formal adjustments. However, cultural similarities usually provide parallelisms of content that make the translation less difficult than when both languages and cultures are far apart. In fact, differences between cultures cause more severe problems than do differences in language structure (Nida 1964: 160).

Bassnett (2002 [1980]: 30) cautions that to impose the value system of the source culture onto the target culture is dangerous and might cause serious problems. Shakespeare's Sonnet Number 18, "Shall I compare thee to a summer's day?", for example, cannot be directly translated into languages that are spoken in areas where summers are unpleasant. Even when the ST author believes that God is male and writes "God the Father", it will not make a natural translation if translated as such into a language where the comparable deity is female. The translator cannot be the author of the ST, but as the author of the TT, s/he has a clear moral responsibility to the TT audience.

6.5.2 Formation of cultural identity

Cultural identity refers to an individual's psychological membership in a particular culture. Venuti (1998: 67) indicates that the most consequential effect of translation may be the formation of cultural identities. The very choice of a foreign text to translate reflects the TL community's domestic interests and establishes its domestic canons for foreign literatures. Naturally, such canons tend to conform to domestic aesthetic values, and, consequently, fix stereotypes for foreign cultures. If they did not conform to domestic standards, they would seem inferior or politically reactionary at home (Venuti 1998: 87). Native speakers of Japanese might be surprised when they discover the reigning popularity of TANIZAKI Jun'ichirō, KAWABATA Yasunari, and MISHIMA Yukio in the United States and other English-speaking nations.

According to *Goo ranking*, as of March 13, 2010, the ten most popular Japanese authors of fiction among Japanese readers are: (1) NATSUME Sōseki, (2) MIYAZAWA Kenji, (3) AKUTAGAWA Ryūnosuke, (4) DAZAI Osamu, (5) EDOGAWA Rampo, (6) MISHIMA Yukio, (7) KAWABATA Yasunari, (8) MORI Ōgai, (9) ENDŌ Shūsaku, (10) INOUE Yasushi.

Commencing in the 1950s, American and British publishers have created a canon of Japanese fiction based on well-established stereotypes. Furthermore, because English translation of Japanese fiction has routinely been translated into other European languages, this canon has spread throughout the Western world (Fowler 1992: 15–16). Tanizaki, Kawabata, and Mishima have mainly been translated by such prominent university professors as Howard Hibbett, Donald Keene, Ivan Morris, and Edward Seidensticker. Their work typically reflects their academic preferences and interests: they often refer to traditional Japanese culture and lament the social changes brought by Western influence (Fowler 1992: 12).

The canon created under the cultural authority of corporate publishers and academic translators did not undergo significant changes during the 1970s and 1980s. However, by the end of the 1980s, it was being criticized by a new generation of translators, and such new anthologies as *Monkey brain sushi: New tastes in Japanese fiction*, edited by Alfred Birnbaum and published in 1991 began to emerge (Venuti 1998: 73). Birnbaum intentionally excludes the “staples of the older diet”, when he writes:

Understandably, these new tastes in writing have split the Japanese reading populace: older critics dismiss the stuff as “not serious literature” or, even, “not Japanese.” It is a distaste for a way of life as much as its fictional projections. All the same, this new generation of writers has won over an under-forty readership in numbers that cannot be ignored. [...] Unabashedly subjective, it sides with the most innovative, the most dynamic, the most fun – and with what most people really read. (Birnbaum 1991: 3–4)

Indeed, this shift has not been welcomed by some critics. While affording rave reviews for works by TSUSHIMA Yūko and ŌE Kenzaburō, among others, Miyoshi (1991) vigorously criticizes those of MURAKAMI Haruki and YOSHIMOTO Banana. He considers Murakami to be preoccupied with the idea of Japan, or what Murakami imagines foreign buyers like to see in references to it. He writes:

[Murakami’s] tales are remarkably fragmented. Adorned with well-placed aphorisms, however, they are “pick-uppable” on any page, and that means an entirely easy read – a smooth popular item of consumption. (Miyoshi 1991: 234)

He has had his first three books translated into English, and is scheduling to release one every year in the United States. Herbert Mitgang of the *New York Times* is apparently impressed with Murakami’s artistic and intellectual accomplishment: he wrote two uninformed and misguided reviews for his paper, as if his assignment were to follow the U.S. administration’s open-door policy in the book market. (Miyoshi 1991: 235)

Miyoshi is even more critical of Yoshimoto’s work.

Murakami’s work looks learned and profound alongside YOSHIMOTO Banana’s books. Her output is entirely couched in baby talk, uninterrupted by humor, emotion, idea, not to say irony or intelligence. No one could summarize any of these books, for they have even less plot and character than Murakami’s unplotted and characterless works. There is no style, no poise, no imagery. (Miyoshi 1991: 236)

Venuti (1998: 85) defends Yoshimoto’s *Kitchen* as translated by Megan Backus. He finds Backus’s translation readable, but at the same time foreignizing, employing heterogeneous language to communicate Americanized Japan and, while at the same time highlighting differences between the two cultures.

The translation generally adheres to the standard dialect of current English usage, but this is mixed with other dialects and discourses. There is a rich strain of colloquialism, mostly American, both in the lexicon and syntax: “cut the crap,” “home-ec” (for “Home Economics”),

“I’m kind of in a hurry,” “I perked up,” “I would sort of tortuously make my way,” “night owl,” [...] There is also a recurrent, slightly archaic formality used in passages that express the fey romanticism to which the narrator Mikage is inclined. “I’m dead worn out, in reverie,” she says at the opening, combining the poetical archaism “reverie” with the colloquial “dead worn out.” (Venuti 1998: 236)

Such heterogeneity of discourse, Venuti continues, offers an estranging experience to English-speaking readers as well as reminding them that the text is a translation. He criticizes Miyoshi for not recognizing these effects and compares the following renditions.

I placed the bedding in a quiet well-lit kitchen, drawing silently soft sleepiness that comes with saturated sadness not relieved by tears. I fell asleep wrapped in a blanket like Linus. (trans. by Masao Miyoshi)

Steeped in a sadness, I pulled my futon into the deadly silent gleaming kitchen. Wrapped in a blanket, like Linus, I slept. (trans. by Megan Backus)

(“I pulled my futon” is a mistranslation. See Hasegawa 2011: 224.) Venuti declares that Backus’s version is more evocative than Miyoshi’s. Miyoshi’s version is “strongly domesticating, assimilating the Japanese text to the standard dialect of English, so familiar as to be transparent or seemingly untranslated” (Venuti 1998: 86). By contrast, Backus’s translation communicates the protagonist’s romantic poeticism through suspending, fluent, but formal syntax. Yoshimoto’s fictional works certainly deviate from the well-established canons because they were not developed by and designed for cultural elitists. Her success is due to “her appeal to a wider, middlebrow readership, youthful and educated, although not necessarily academic” (Venuti 1998: 87). As Venuti insightfully comments, Backus is sufficiently adroit to recreate Yoshimoto’s artistry of vagueness, *nantonaku wakarū* ‘I understand it somehow’, so appealing to the younger generation. If translated in Miyoshi’s manner exemplified above, her work would lose its core essence.

7 Conclusion

This chapter has considered various aspects of translation from a theoretical perspective. It began with discussion of what counts as translation (section 1) and what contributes to translatability across languages (section 2). It is not enlightening to pursue whether or not a given set of texts qualifies as translational equivalents; rather, we should examine how far apart these texts are when considered as translations. Regarding translatability, if detaching content and form is impossible (i.e., when form constitutes a significant part of the meaning of the text), adequate translation cannot be attained by application of conventional translation techniques.

Section 3 presented eight common translation techniques illustrated by examples derived from Japanese-to-English as well as English-to-Japanese translation: borrowing, calque, literal translation, transposition, modulation, equivalence, adaptation, and omission. Next, information addition, deletion, and offsetting, sometimes inevitable in translation, were briefly discussed in section 4.

Section 5 was devoted to rhetorical differences between English and Japanese that must be taken into consideration when translating; focus was on textual organization, paragraphing, verbiage, and phaticity. Finally, section 6 provided a historical overview of theoretical approaches to translation, spanning from the Cicero (106 BC–43 BC) era to contemporary perspectives, and including Dryden's and Schleiermacher's conceptualizations of translation, Nada's linguistically oriented theory, goal-oriented Skopos Theory, Negative Analytic that focuses on inevitable distortion in translation, and culturally-oriented approaches.

Translation Studies covers diverse topics pertaining to the art and craft of translation: ranging from contrastive linguistics to intercultural communication. Also significant but to which little attention has been paid is how translations have contributed to cross-cultural understanding. While the history of translation of Western literature of various kinds into Japanese has been considerably studied, the circumstances surrounding translation of Japanese texts into other languages are yet to be explored – which texts have been selected, by whom, and for what purposes. Also worthy of study is identification of the translators, their motivations, and what kind of linguistic training they received.

References

- Baker, Mona. 2000. Linguistic perspectives on translation. In Peter France (ed.), *The Oxford guide to literature in English translation*, 20–26. Oxford: Oxford University Press.
- Bassnett, Susan. 2002 [1980]. *Translation studies*. London: Routledge.
- Bell, Roger. 1991. *Translation and translating: Theory and practice*. London: Longman.
- Berman, Antoine. 2000 [1985]. Translation and the trials of the foreign, trans. by Lawrence Venuti. In Lawrence Venuti (ed.), *The translation studies reader*, 285–297. London: Routledge.
- Birnbaum, Alfred. 1991. *Monkey brain sushi: New tastes in Japanese fiction*. Tokyo: Kodansha International.
- Catford, John. 1965. *A linguistic theory of translation*. London: Oxford University Press.
- Chomsky, Noam. 1957. *Syntactic structures*. The Hague: Mouton.
- Chomsky, Noam. 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.
- Cicero, Marcus Tullius. 1960 [46 BC]. *De inventione, de optimo genere oratorum, topica*, trans. by Harry Hubbell. Cambridge, MA: Harvard University Press.
- Dryden, John. 1992 [1680]. On translation. In Rainer Schulte and John Biguenet (eds.), *Theories of translation: An anthology of essays from Dryden to Derrida*, 17–31. Chicago: University of Chicago Press.
- Fowler, Edward. 1992. Rendering words, traversing cultures: On the art and politics of translating modern Japanese fiction. *Journal of Japanese Studies* 18. 1–44.

- France, Peter. 2000. Translation studies and translation criticism. In Peter France (ed.), *The Oxford guide to literature in English translation*, 3–10. Oxford: Oxford University Press.
- Halliday, M.A.K., Angus McIntosh and Peter Strevens. 1965. *The linguistic sciences and language teaching*. London: Longmans.
- Hasegawa, Yoko. 2011. *The Routledge course in Japanese translation*. London: Routledge.
- Hatim, Basil and Jeremy Munday. 2004. *Translation: An advanced resource book*. London: Routledge.
- Hinds, John. 1990. Inductive, deductive, quasi-inductive: Expository writing in Japanese, Korean, Chinese, and Thai. In Ulla Connor and Ann Johns (eds.), *Coherence in writing: Research and pedagogical perspectives*, 87–110. Alexandria, Va.: Teachers of English to Speakers of Other Languages.
- Hōjō, Fumio. 2004. *Hon'yaku to ibunka: Gensaku to no zure ga kataru mono* [Translation and foreign culture: What discrepancies from the original text can tell us]. Tokyo: Misuzu Shobō.
- Jakobson, Roman. 2000 [1959]. On linguistic aspects of translation. In Lawrence Venuti (ed.), *The translation studies reader*, 113–118. London: Routledge.
- Kawabata, Yasunari. 1981. *Snow country*, trans. by Edward Seidensticker. New York: Perigee.
- Kern, Richard. 2000. *Literacy and language teaching*. Oxford: Oxford University Press.
- Kōno, Ichirō. 1975. *Hon'yaku jōtatsuhō* [How to improve your translation skills]. Tokyo: Kōdansha.
- Kramsch, Claire. 2006. From communicative competence to symbolic competence. *The Modern Language Journal* 90. 249–252.
- Malinowski, Bronislaw. 1999 [1923]. On phatic communication. In Adam Jaworski and Nikolas Coupland (eds.), *The discourse reader*, 302–305. London: Routledge.
- Miyoshi, Masao. 1991. *Off center: Power and culture relations between Japan and the United States*. Cambridge, MA: Harvard University Press.
- Munday, Jeremy. 2001. *Introducing translation studies: Theories and applications*. London: Routledge.
- Neubert, Albrecht and Gregory Shreve. 1992. *Translation as text*. Kent, Ohio: Kent State University Press.
- Nida, Eugene. 1964. *Toward a science of translating*. Leiden: E. J. Brill.
- Nida, Eugene and Charles Taber. 1969. *The theory and practice of translation*. Leiden: E. J. Brill.
- Nord, Christiane. 1991. Text analysis in translator training. In Cay Dollerup and Anne Loddegaard (eds.), *Teaching translation and interpreting: Training, talent and experience*, 39–48. Amsterdam: John Benjamins.
- Ōno, Susumu. 1978. *Nihongo no bunpō o kangaeru* [A study of Japanese grammar]. Tokyo: Iwanami Shoten.
- Reið, Katharina. 2000 [1971]. Type, kind and individuality of text: Decision making in translation, trans. by Susan Kitron. In Lawrence Venuti (ed.), *The translation studies reader*, 160–171. London: Routledge.
- Reið, Katharina and Hans Vermeer. 1984. *Grundlegung einer allgemeinen translationstheorie* [Groundwork for a general theory of translation]. Tübingen: M. Niemeyer.
- Riggs, Lynne. 1991. Notes from interlingual hell: The translation of essays and journalistic prose. *Society of Writers, Editors, and Translators Newsletter* 51. 10–12.
- Schleiermacher, Friedrich. 1992 [1813]. From 'On the different methods of translating', trans. by Waltraud Bartscht. In Rainer Schulte and John Biguenet (eds.), *Theories of translation: An anthology of essays from Dryden to Derrida*, 36–54. Chicago: University of Chicago Press.
- Seidensticker, Edward. 1989. On trying to translate Japanese. In John Biguenet and Rainer Schulte (eds.), *The craft of translation*, 142–153. Chicago: University of Chicago Press.
- Seidensticker, Edward and Tetsuo Anzai. 1983. *Nihonbun no hon'yaku* [Translating Japanese sentences]. Tokyo: Taishūkan.
- Snell-Hornby, Mary. 1995 [1988]. *Translation studies: An integrated approach*. Amsterdam: John Benjamins.

- Snell-Hornby, Mary. 1991. The professional translator of tomorrow: Language specialist or all-round expert? In Cay Dollerup and Anne Loddegaard (eds.), *Teaching translation and interpreting: Training, talent and experience*, 9–22. Amsterdam: John Benjamins.
- Snell-Hornby, Mary. 2006. *The turns of translation studies*. Amsterdam: John Benjamins.
- Steiner, George. 1975. *After Babel: Aspects of language and translation*. New York: Oxford University Press.
- Terry, Charles. 1985. A live dog: Some pointers on translation. *Undercurrent: The Japan Scene, Past and Present* 3. 2–12.
- Toyama, Shigehiko. 1987. *Nihongo no ronri* [The logic of the Japanese language]. Tokyo: Chūō Kōronsha.
- Ueda, Makoto. 2000. Haiku wa hon'yaku dekiru no ka: Hon'yaku to iu kokoromi no hontō no imi o kangaeru tameni [Is it possible to translate haiku? A consideration of the real meaning of the act of translation]. In Tōru Haga (ed.), *Hon'yaku to Nihon bunka* [Translation and Japanese culture], 115–128. Tokyo: Yamakawa Shuppansha.
- Venuti, Lawrence. 1995. *The translator's invisibility: A history of translation*. London: Routledge.
- Venuti, Lawrence. 1998. *The scandals of translation*. London: Routledge.
- Vermeer, Hans. 1978. Ein rahmen für eine allgemeine translationstheorie [A framework for a general theory of translation]. *Lebende Sprachen* 23. 99–102.
- Viaggio, Sergio. 1994. Theory and professional development: Or admonishing translators to be good. In Cay Dollerup and Annette Lindegaard (ed.), *Teaching translation and interpreting 2: Insights, aims, visions*, 97–105. Amsterdam: John Benjamins.
- Vinay, Jean-Paul and Jean Darbelnet. 1995 [1958]. *Comparative stylistics of French and English: A methodology for translation*, trans. by Juan Sager and M.-J. Hamel. Amsterdam: John Benjamins.
- Wakabayashi, Judy. 1990. Some characteristics of Japanese style and the implications for Japanese/English translation In *Proceedings of the First International Japanese-English Translation Conference*, 59–74. Tokyo: Japan Association of Translators.
- Wierzbicka, Anna. 1992. *Semantics, culture, and cognition: Universal human concepts in culture-specific configurations*. New York: Oxford University Press.

VII Sign languages

Daisuke Hara

17 Japanese Sign Language: An introduction

1 Introduction

Linguistic studies on sign language were launched in the United States in the late 1950s. It was about twenty years later that studies of Japanese Sign Language (JSL) began in Japan, when an academic organization for JSL studies, the predecessor to the current *Japanese Association for Sign Language Studies*, was founded (Yonekawa 2002). In its early stage, even several years after its foundation, sign language had not been well recognized as a full-fledged natural language. There are several reasons for this.

First, sign language looks like gestures or pantomime since they both use hand and body movements and no linguistic sounds. Its use of facial expressions was also a cause of misunderstanding about its linguistic status. They are usually used to express one's emotions, and nobody might expect them to be used as grammatical markers or part of lexical items. In fact, sign language like JSL uses body-part movements such as eyebrow raising, head nodding, and body leaning as part of its grammar: some distinguish declarative, interrogative, and negative sentences and some mark topicalization and grammatical aspect.

Second, JSL, for no particular reason, had been thought of as developmentally related to, or even as being formed directly based on, the Japanese language, or as an insufficient Japanese used by deaf people as an alternative means for Japanese. It has recently become clear, however, that JSL has its own grammar different from Japanese language grammar. Its verbs of a certain type, for instance, inflect for person and number of subject and/or object while Japanese verbs do not. It also has an agreement auxiliary verb which represents grammatical relations (Fischer 1996). In addition, the sites in which the WH element appears also differ between Japanese and JSL. The former allows it to occur in situ or to appear in many other sites while sentence-final is almost only site for the JSL WH elements.

Third, the existence of another type of signing system prompted the misunderstanding and confusion. It is called *Nihongo Taiō Shuwa*, or 'Manually Coded Japanese' (MCJ). Both signing systems are represented by hands and have many signs in common. They are different, however, in that JSL is a language genetically and linguistically not associated with Japanese while MCJ is another form of Japanese, which is manually represented, stringing signs together into sentences in the same way as Japanese.

This chapter is devoted to providing general and basic knowledge of sign language and, especially, of JSL. For reasons of space, the range of information covered is limited. Section 2 outlines the onset of sign language linguistics, revealing what functions as the phoneme of sign language. Section 3 focuses on miscellaneous

issues on JSL. Section 3.1 discusses the history of JSL and its population. It is impossible to date the birth of JSL because it has no written record, but pieces of evidence from its peripheral domains could allow us to imagine how it arrived on earth. The other subsections take up a few grammatical topics such as verb morphology, non-manual markers (NMMs), and JSL word order. NMMs are unique to sign language and are thus worth mentioning here. Among them is another topic on MCJ. It provides us with a distinction between MCJ and JSL. Section 4 concludes this chapter.

2 The onset of sign language linguistics

In the late 1950s, William Stokoe went to Gallaudet College, which is now Gallaudet University, as an English teacher. When he saw students talking in American Sign Language (ASL), he considered ASL to be a full-fledged natural language while most of his colleagues at that time thought of it as something like pantomime or manually represented broken English. Believing that ASL was a language on its own, he started to try to prove its language status. What he did to prove ASL to be one of the natural languages was to show that ASL has double articulation, which is the most distinctive characteristic of human language: i.e., a sentence can be divided into the smallest meaningful units, or morphemes, which are further subdivided into phonemes, that is, meaningless building blocks. Difficulties in showing that ASL has double articulation lie in the fact that ASL does not use any speech sounds like spoken language does, and also in the fact that it seems impossible to segment the ASL sign (equivalent of the word in spoken language) into further smaller units because it seems like a monolith. Due to these facts, it was difficult to apply existing linguistic theories based on spoken language to sign language analyses. We would like to take a look at how Stokoe tackled this problem and proved the double articulation of ASL.

2.1 Aspects and cheremes

Utilizing minimal pairs, Stokoe (1960) showed that the sign was not a monolithic entity but was composed of, at least, three different components: handshape, movement, and location. He called these components *aspects*, each of which has a definite number of elements as its members, and one or two elements in each aspect combine with each other to form a sign. He calls these phoneme-like elements *cheremes*. For instance, the ASL sign *GO* in Figure 1 is composed of the handshape called *1-handshape* (which is originally called G-handshape but is called this way here), the movement away from the singer with circular action, and the location called *zero* (or neutral space) which is the space that is within reach of the arm in front of the signer.



Figure 1: GO (ASL)

Stokoe has eventually recognized 19 handshapes, 24 movements and 12 locations as cheremes. There are some researchers like Battison (1978) who consider hand orientation as the fourth component because there are some sign pairs, the meanings of which can be only distinguished by the hand orientation. Hand orientation is, however, now treated as the relation of the handpart and plane of articulation or something else, and not a primary component (Brentari 1998; Sandler 1989; Stokoe 1960; Uyechi 1996). It is now widely accepted that the sign is composed of, at least, three elements that belong to the three basic components of handshape, movement, and location.

2.2 Phonemes in sign language

The handshape, movement, and location function as sign-forming elements, and are currently thought of as phonemes of sign language. Of course, no sound is involved in sign language, and thus the term *phoneme* seems not to be appropriate. Why do sign language linguists nevertheless use the term to refer to what Stokoe calls cheremes? The reason is that the handshape, movement, and location each function in exactly the same way as phonemes in spoken language do. Remember the definition of the phoneme. There are several definitions for it, but if they are summed up in a single sentence, that will be like “a phoneme is the smallest unit that exists in abstract form, which itself does not have meaning but which can combine to form a meaningful unit, and has the power to make a distinction between meanings of two (or more than two) morphemes or words.” The word “abstract” means that a phoneme in itself does not have any specific physical form but exists in the mind, and will be realized by something physical to be recognized. The phone is the realization of the phoneme in spoken language. Note that this definition can apply to sign language on its own. That is, the handshape, movement, and location, each of which does not have a specific meaning, combine to form a sign, distinguishing sign meanings, namely, standing in phonological opposition. To confirm these points, look at examples from JSL shown in Figures 2 to 5.

The signs in the figures are not indecomposable monoliths but are formed by combining one or two of phonemes from each of the three components. For instance, the sign *OMOO* ‘THINK’ in Figure 2a is composed of the handshape with the index



Figure 2: a. *OMOO* 'THINK' b. *IKU* 'GO'



Figure 3: a. *WAKAI* 'YOUNG' b. *KOOKOO* 'HIGH SCHOOL'



Figure 4: a. *KIIRO* 'YELLOW' b. *NARUHODO* 'HMMM'



Figure 5: a. *TANOMU* 'ASK' b. *NANTYOO* 'HARD OF HEARING'

finger straight from the fist (or 1-handshape), the right temple location, and the movement straight to the contact point while the sign *WAKAI* 'YOUNG' in Figure 3a is composed of the flat handshape (or B-handshape), the forehead location, and the rightward movement. It is also noteworthy that each constituent does not have a specific meaning. The signs *OMOO* 'THINK' and *IKU* 'GO' in Figure 2 each contain the 1-handshape, but they do not share any meaning in common such as {one}, {straight}, {long} and the like. Neither do the sign *WAKAI* 'YOUNG' in Figure 3a and the sign *KIIRO* 'YELLOW' in Figure 4a share the meaning such as {forehead} or {brain} although they are both represented on the forehead location. This holds of rightward movement in the signs *AKAI* 'RED', *TAIRA* 'FLAT', and *ZYUNBI* 'PREPARE', whose pictures are omitted here due to the limited space. They all have the rightward movement, but it does not represent a specific meaning such as {right} at all. That is, the handshape, location, and movement all function just as building blocks of the sign.

We should also refer to the distinctive function of the phoneme. Pairs of signs in Figure 3 to Figure 5 are all minimal pairs. *WAKAI* 'YOUNG' and *KOOKOO* 'HIGH-SCHOOL' in Figure 3 have the same location and the same movement but different handshapes: the former has the B-handshape, and the latter the U-handshape (a handshape with the index and middle fingers fully extended from the fist). Likewise, in the pairs *KIIRO* 'YELLOW' / *NARUHODO* 'HMMM' and *TANOMU* 'ASK' / *NANTYOO* 'HARD OF HEARING', the forehead location and the chin location, and the forward movement and the downward movement are respectively in opposition.

As we have seen, the sign in sign language is a decomposable unit just like a word in spoken language. The sign is segmented at least into one handshape, one movement, and one location. If we substitute one of these elements for another in some sign, the sign will be a different or nonsense sign. Namely, these constituent elements have the power to change sign meanings, and thus function in exactly the same way as the phonemes of spoken language.

What Stokoe has proved is the existence of dual articulation in sign language, which has let sign language be upgraded from pantomime to human language, and sign languages have since begun to receive attention in linguistic research.

3 Japanese Sign Language

JSL, or Japanese Sign Language, has been used in Japan quite a long time, but we do not know exactly how long it has been in Japan because JSL has had no writing system for daily use in its history, and thus there remains no record that describes the history of JSL development. It is generally said, however, that the establishment of *Kyōto Mōain*, or the Kyoto School for the Blind and the Deaf, was the beginning of JSL (Kimura 2011). In 1878 Tashiro Furukawa gathered 31 deaf children in the school and provided education to them. Kimura (2011) says that they created a pidgin sign language, and that some years after they got together, the pidgin developed into a creole sign language, which was the original form of JSL. This view seems to be supported when compared to the situation in which Nicaraguan Sign Language (NSL) was born, a development witnessed in the latter part of the twentieth century. In Nicaragua, there was no deaf community until 1977, and thus deaf people had been isolated from one another. In 1977, however, the Nicaraguan government established a large education center where deaf children got together and a vocational school for deaf adolescents a few years later. Deaf children who came together in the center formed a linguistic community, in which NSL began to emerge although it was not grammatically full-fledged yet. When children of the second generation came into the community, they made the signing system used by the first generation a richer, full-fledged language. This was the emergence of NSL, and has shown that two generations are long enough for a new language to emerge if certain conditions are met (Senghas, Senghas, and Pyers 2005).

It may be true that JSL was thus brought into being around 1878, but if we took Japanese deafness gene mutation into consideration along with the birth story of NSL, we could imagine another scenario for the birth of JSL. The website created by the School of Medicine, Department of Otorhinolaryngology at Shinshu University says that approximately 0.1 % of newborn babies in Japan are born deaf, and they infer that deafness gene is involved in half of those cases (Usami 2010). The percentage may vary slightly from time to time, but it is natural to assume that deaf people have existed since a long time ago because it is not likely that the gene occurred just in a few hundred years. Then, we could conjecture from these two facts that if deaf children are born, and some of them come together in the same community, they will create that full-fledged sign language through a rudimentary signing system in two generations, which would be handed down from generation to generation. Probably, in history, various sign languages emerged and disappeared at various times and places in Japan, and contemporary JSL could be one of them.

Going back to the present day, what is the current population of native JSL signers in Japan? We have only two reports available, according to which there are estimated to be between 35,000 and 57,000 in Japan (Ichida et al. 2001, Kanda, Kimura, and Hara 2008). The newspaper *Asahi Shimbun* (July 26, 2013) has also reported that Japanese Association for Sign Language Studies estimates that there are 50,000 to 60,000 JSL signers in Japan. In any case, it follows that the JSL signers account only for 0.05% or so of the national population, 127,000,000 as of 2014, and, thus, JSL is definitely a minority language. Incidentally, the number of 60,000 is approximately half as many as the number of people born deaf, and accounts for about 22% of all the hearing-impaired people in Japan (including congenital and acquired deafness), the number of whom is 276,000 according to the survey on persons with physical disability conducted by Ministry of Health, Labour and Welfare in 2006.

3.1 Verb morphology

JSL has three types of verbs: the agreement verb, the spatial verb, and the plain verb just as in ASL (Padden 1988). The agreement verb inflects to agree with subject and/or object. If the subject is *WATASI*, 'I' (the first person singular), and the object is *KARE*, 'him' (the third person singular), then the hand moves from the locus of the first person, i.e., from the signer's body, to the locus where the object is represented in space. In the agreement verb, the loci function as agreement morphemes, and thus the agreement verb consists of more than one morpheme such as a verb stem plus two agreement morphemes. In JSL, the agreement is not always obligatory, and there are cases in which it is omitted.

The spatial verb also changes the verb form in accordance with the location where the entity described by the verb is first located and the location to which it is transferred. For instance, in the sentence (1) the hand representing *HON*, 'the

book', moves from the location marked with the index *a* to the one marked with the index *b*.

- (1) TANAKA HON _aMOVE_b
 Tanaka book LOC-move-LOC
 'Tanaka moves/moved the book from one location to another.'

These locations function as locative affixes, and thus the spatial verb consists of at least the verb stem and locative affixes. The agreement verb and spatial verb morphologically look the same since they both consist of the stem and affixes, but the spatial verb does not inflect for subject and object but for the locatives and therefore does not agree with the locus of the subject or object.

The third type of verb is the plain verb. The plain verb does not agree with any grammatical argument or have any locative affix. For the plain verb, the grammatical relations are represented by the word order; the JSL basic word order is Subject-Object-Verb (SOV). In sentences in which the plain verb is used, however, there is another way available to show grammatical relations, namely, use of an agreement auxiliary. Agreement auxiliaries are found in many different sign languages (Steinbach 2011), and JSL is one of those languages. In (2) AUX-1 is represented by the index finger first pointing to the locus of CHILD and then to the locus of TEACHER. The transition is so smooth that it seems like it describes a trajectory from one locus to another.

- (2) CHILD_{3a} TEACHER_{3b} LIKE _{3a}AUX-1_{3b}
 'The child likes the teacher.'
 (Fisher 1996: 107)

In passing, it is also worth mentioning another auxiliary verb in JSL although it is not related to agreement. *KURU* is a verb meaning 'to come', but through the process of grammaticalization it has been semantically extended to function as a modal auxiliary as in (3). In (3a) *KURU* represents the speaker's strong confidence while in (3b) the speaker's inference. Although both sentences cited here include only plain verbs, the same construction can also co-occur with the agreement verb.

- (3) a. ATO WAKARU KURU
 later understand come
 'You must understand later.'
- b. ZIKO-O-OKOSU KURU-PT₃
 have-an-accident come-3.PRON
 'He may have an accident someday.'
 (Kimura 2011: 117–118, 151)

Finally, to be clear, it is not always the case that the plain verb does not change form. It does not change form to agree with the grammatical argument or the locative, but it can inflect for some other categories such as aspect, like the other types of verbs do. For instance, a continuative aspect is represented by reiterating the movement of the verb. Thus, the verb *NAKU* ‘to cry’, which is a plain verb, can be inflected for the continuative aspect to mean ‘to continue to cry’ by movement reiteration. Needless to say, aspectual markers like the continuative can also occur with agreement verbs.

3.2 Non-manual marker

We call sign language *shuwa* in Japanese. The literal translation is ‘hand talk’. The Japanese word *shuwa* gives us the impression that sign language is spoken exclusively by the hand. It is true that the hand plays a central role in JSL, but it is not the only constituent. Non-manual markers (NMMs) are also indispensable grammatical elements. They serve grammatical functions as well as word-formational functions. The NMMs play roles, for instance, in distinguishing sentential types such as the declarative, interrogative, and negative sentences, and also clausal types such as the relative clause and the conditional clause (Ichida and Kimura 1995, Kimura 2011, Oka and Akahori 2010). (For further information on NMMs, see Chapter 19 “Syntax of Japanese Sign Language.”) They are also used to mark grammatical relations and topics in the topic-comment structure. The NMM is generally represented by one or some of eyebrow raising, eye gaze, head movement, nodding, and body posture, among others. See the sentences in (4a) and (4b). Both sentences consist of identical words which are aligned in the same order. Namely, they are represented manually in the same way. But the sentence (4b) is accompanied by a set of NMMs indicated by *q*, which consists of eyebrow raising, widened eyes, and the nodding which co-occurs with a sentence-final word, i.e., *HON* in the example. The set indicates that the sentence is an interrogative, and can clearly distinguish the interrogative sentence from its declarative counterpart. Some more examples of NMMs are shown in the following subsection.

- (4) a. PT₂ KAU HON
 you buy book
 ‘You buy/bought book.’
- _____q
- b. PT₂ KAU HON
 you buy book
 ‘Do/did you buy book?’

3.3 Word order

The basic word order of JSL is, as above mentioned, SOV, or $SO_{(DAT)}O_{(ACC)}V$ if there are two objects. When a plain verb is used, the word order must be strictly observed unless an element like the agreement auxiliary which keeps grammatical relations unambiguous accompanies the verb. If syntactic operations which force word order to change apply to a sentence including the plain verb, elements moved will be marked by NMMs. See the sentences in (5). (5a) follows the basic word order while (5b) and (5c) topicalize the indirect object and the direct object respectively, with the topicalized elements accompanied by a certain set of NMMs (symbolized by *t*) consisting of eyebrow raising and nodding that occurs at the end of topicalization. Sentences in (6) include the plain verb *SUKI* ‘to like’ and the agreement auxiliary AUX-1. Although the object is topicalized and thus precedes the subject in the sentences (6b) and (6c), the grammatical relation is not ambiguous since the auxiliary agrees with the subject and object.

Digressing from the present topic, we should mention yet another auxiliary verb appearing in the example sentences. In (5), the verb *AGERU* ‘to give’ is followed by the suffix *-OWARU*. It originally comes from a verb *OWARU* ‘to finish’, but it is separated from the original verb and has become a verbal suffix which functions as a perfective marker. It is worth noting that the suffix accompanies an NMM *pa*, which is a mouth gesture moving the mouth in the way in which a syllable [pa] is pronounced. Note that the mouth gesture is different from just mouthing a Japanese syllable or word, but is the mouth movement which denotes a specific meaning either along with or without the manual sign with which it co-occurs.

- (5) a. $\text{TANAKA}_a \text{ SUZUKI}_b \text{ HON } a\text{AGERU}_b\text{-OWARU}$ $\text{_____}pa$
 Tanaka Suzuki book SBJ-give-OBJ-CMPL
 ‘Tanaka gave the book to Suzuki.’
- b. $\text{_____}t$ $\text{_____}pa$
 $\text{SUZUKI}_b \text{ TANAKA}_a \text{ HON } a\text{AGERU}_b\text{-OWARU}$
 Suzuki (TOP) Tanaka book SBJ-give-OBJ-CMPL
 ‘As for Suzuki, Tanaka gave him the book.’
- c. $\text{_____}t$ $\text{_____}pa$
 $\text{HON } \text{TANAKA}_a \text{ SUZUKI}_b a\text{AGERU}_b\text{-OWARU}$
 book (TOP) Tanaka Suzuki SBJ-give-OBJ-CMPL
 ‘As for the book, Tanaka gave it to Suzuki.’
- (6) a. $\text{TANAKA}_a \text{ SUZUKI}_b \text{ SUKI } a\text{AUX-1}_b$
 Tanaka Suzuki like SBJ-AUX-OBJ
 ‘Tanaka likes Suzuki.’

- _____ *t*
 b. SUZUKI_b TANAKA_a SUKI _aAUX-1_b
 Suzuki (TOP) Tanaka like SBJ-AUX-OBJ
 ‘As for Suzuki, Tanaka likes him/her.’
- _____ *t*
 c. SUZUKI_b TANAKA_a _aAUX-1_b SUKI
 Suzuki (TOP) Tanaka SBJ-AUX-OBJ like
 ‘As for Suzuki, Tanaka likes him/her.’

Back to the word order, a *wh*-question in JSL also changes the word order. Unlike the Japanese language, JSL generally does not allow the *wh*-element to occur in situ but moves it to the sentence-final position as in (7). The *wh*-element is accompanied by a set of NMMs, marked by *whq*, which includes either of eyebrow raising or eyebrow lowering, chin poking, and head shaking (Kimura 2011).

- (7) a. TANAKA HON KAU
 Tanaka book buy
 ‘Tanaka buys/bought a book/the book/books.’
- _____ *whq*
 b. TANAKA KAU NANI
 Tanaka buy what
 ‘What does/did Tanaka buy?’

Another phenomenon which influences apparent word order is pronoun deletion and sentence-final pointing. JSL is a type of pro-drop language, but is different from Romance languages like Italian and Spanish. In JSL not only a subject pronoun but also practically all grammatical arguments can be omitted as long as what is omitted is inferable. In (8a) both the subject and object are omitted although the verb *SIRU* ‘know’ is a plain verb. (8b) has the sentence-final pointing *PT_i*, which points to the body of the signer, phonologically similar to the first person pronoun but leans to the verb *SIRU* just like the clitic. The occurrence of the pointing seems optional, and if it occurs, it refers to the sentential subject. If the subject NP or pronoun is omitted for some reason while the sentence-final pointing remains after the verb, then the apparent word order will be OVS: e.g., in (8b) *TANAKA* would look like the subject, and *PT_i* the object, which is, of course, a wrong interpretation.

Interestingly, the sentence-final pointing also can refer to a non-subject element which is moved to the sentence-initial position by topicalization (Hara and Kurosaka 2013). When nothing is topicalized, the sentence-final pointing can only refer to the subject as (9a) and (9b) show. If a topicalized element exists in the sentence, however, a sentence-final pointing can refer to it even if the referent is not a grammatical

subject. In (9c) the object of the verb is topicalized, and thus PT_3 can point to it. Needless to say, a pointing referring to the subject can appear sentence-finally in any sentence as in (9d). The ability of the sentence-final pointing to refer to a topicalized element is very unique, and Sign Language of the Netherlands (NGT) has been reported to have this type of sentence-final pointing (Crasborn et al. 2009). Further studies are expected.

- _____ *hm*
- (8) a. SIRU
know
'(I) know (him/her/them).'
- b. (PT₁) TANAKA SIRU(-PT₁)
(I) Tanaka know(-1.PRON)
'I know Tanaka.'
- (9) a. PT₁ HON KAU-PT₁
I book buy-1.PRON
'I bought the book.'
- b. *PT₁ HON KAU-PT₃
I book buy-3.PRON
'I bought the book.'
- _____ *t*
- c. HON PT₁ KAU-OWARU-PT₃
book I buy-CMPL-3.PRON
'As for the book, I bought.'
- _____ *t*
- d. HON PT₁ KAU-OWARU-PT₁
book I buy-CMPL-1.PRON
'As for the book, I bought.'

3.4 Types of signing systems

Many people in Japan know the word *shuwa* 'sign language', but not many know that there are at least two types of signing systems. One is, of course, Japanese Sign Language, and the other *Shushi Nihongo* 'Signed Japanese'. The latter is also called *Nihongo Taiō Shuwa* 'Manually Coded Japanese' (MCJ). JSL is a natural sign language which is genetically and linguistically not associated with spoken Japanese while the grammar of MCJ is said to be based on Japanese grammar. MCJ borrows words from JSL, but strings them together into sentences in the same way

as Japanese does. For instance, the *wh*-element in MCJ generally appears in situ exactly as in Japanese while JSL has the *wh*-element sentence-finally. MCJ is also different from JSL in that it rarely uses the NMM. MCJ distinguishes sentence types almost exclusively lexically, whereas sentence types in JSL are distinguished by NMMs. Another difference between MCJ and JSL is that the JSL signer does not or cannot sign with speaking Japanese while the MCJ signer often signs MCJ with uttering Japanese words simultaneously. MCJ can do that since it generally follows the Japanese word order. On the other hand, the JSL signer cannot do both at once at any time because a JSL sentence and its Japanese counterpart would not be in one-to-one correspondence.

The typical users of MCJ are late-deafened people, hard-of-hearing people, and hearing sign-language learners. It is difficult to show exactly how many people use MCJ rather than JSL, but it is obvious that the number of MCJ users is much higher than the number of JSL users. This is partly related to the fact that late-deafened people and hard-of-hearing people used to be (or are even now) speakers of Japanese. It is much easier for them to learn and use MCJ than JSL because they have acquired the Japanese grammar. The majority of hearing signers are also using MCJ for the same reason, and also because MCJ has been taught to them in a lot of places in Japan although JSL teachers are recently beginning to be trained and to teach JSL in major metropolitan areas.

4 Conclusion

We have had an overview of when and how sign language research was launched, statistic data on deafness, the verb morphology, non-manual markers, auxiliaries, word order of JSL, and types of signing systems in Japan. They are a small part of the issues regarding JSL studies, and, indeed, we have many more topics yet to be discussed, but we cannot spare space for them here. Instead, the following chapters pick up some of the interesting topics in the JSL studies, and discuss them in greater detail.

References

- Battison, Robin. 1978. *Lexical borrowing in American sign language*. Silver Spring, MD: Linstok Press.
- Brentari, Diane. 1998. *A prosodic model of sign language phonology*. Cambridge, MA: MIT Press.
- Crasborn, Onno, Els van der Kooij, Johan Ros, and Helen de Hoop. 2009. Topic agreement in NGT (Sign Language of the Netherlands). *The Linguistic Review* 26. 355–370.
- Fischer, Susan. 1996. The role of agreement and auxiliaries in sign language. *Lingua* 98. 103–120.

- Hara, Daisuke and Michiyo Kurosaka. 2013. Nihonshuwa no bunmatsu no yubisashi ga sashishimesu mono wa nanika [What does the sentence-final pointing point to?]. *Proceedings of the 39th Annual Meeting of Japanese Association for Sign Language Studies*, 16–17.
- Ichida, Yasuhiro and Harumi Kimura. 1995. *Hajimete no shuwa: Shoho kara yasashiku manaberu shuwa no hon* [The first Japanese Sign Language: You can learn JSL from the beginning]. Tokyo: Bungeisha Co., Ltd.
- Ichida, Yasuhiro, Yuka Namba, Momoko Fukuhara, Mieko Miyake, and Miki Yoshii. 2001. Nihonshuwa bogowasha jinkō suikei no kokoromi [Demographic shifts of the native signers of Japanese Sign Language]. *Proceedings of the 27th Annual Meeting of Japanese Association for Sign Language Studies*, 42–45.
- Kazuyuki, Kanada, Tsutomu Kimura, and Daisuke Hara. 2008. Nihon no rōsha jinkō no suikei [Demographic shifts of the deaf people in Japan]. *Proceedings of the 34th Annual Meeting of Japanese Association for Sign Language Studies*, 14–15.
- Kimura, Harumi. 2011. *Nihon shuwa to nihongo taiō shuwa (shushi nihongo): Aida ni aru fukai tani* [Japanese Sign Language and Manually Coded Japanese (Signed Japanese)]. Tokyo: Seikatsushoin Co., Ltd.
- Oka, Norie and Hitomi Akahori. 2011. *Nihonshuwa no shikumi* [The structure of Japanese Sign Language]. Tokyo: Taishukan Publishing Co., Ltd.
- Padden, Carol. 1988. *Interaction of morphology and syntax in American Sign Language*. New York, NY: Garland.
- Sandler, Wendy. 1989. *Phonological representation of the sign: Linearity and nonlinearity in American Sign Language*. Dordrecht: Foris.
- Senghas, Richard, Ann Senghas, and Jennie Pyers. 2005. The emergence of Nicaraguan Sign Language: Questions of development, acquisition, and evolution. In Jonas Langer, Constance Milbrath and Sue Taylor Parker (Eds.), *Biology and knowledge revisited: From neurogenesis to psychogenesis*, 287–306. Mahwah: Erlbaum.
- Usami, Sinichi. 2010. Nihonjin nanchō idenshi dētābēsu [Japanese deafness gene mutation database]. <http://www.shinshu-u.ac.jp/faculty/medicine/chair/ent/nancho/deafgene1.html> (accessed 20 August 2013)
- Steinbach, Markus. 2011. What do agreement auxiliaries reveal about the grammar of sign language agreement?. *Theoretical Linguistics* 37. 209–221.
- Stokoe, William C. 1960. *Sign language structure: An outline of the visual communication systems of the American deaf*. (Studies in Linguistics. Occasional Paper 8). Buffalo, NY: University of Buffalo.
- Uyechi, Linda. 1996. *The geometry of visual phonology*. Stanford, CA: CSLI Publications.
- Yonekawa, Akihiko. 1984. *Shuwa gengo no kijutsuteki kenkyū* [Descriptive study of Japanese Sign Language]. Tokyo: Meiji Shoin.
- Yonekawa, Akihiko. 2002. *Shuwa to iu kotoba: Mōhitotsu no Nihon no gengo* [The language of Sign Language: Another language in Japan]. Tokyo: PHP Kenkyūjo.

Daisuke Hara

18 An information-based approach to the syllable formation of Japanese Sign Language

1 Introduction

The syllable of Japanese Sign Language (JSL) is composed of elements in three major components, namely, the handshape, the movement, and the location component. Each component has a limited number of elements in it. It is composed of one or, at most, two elements in each component. Not all the combinations thus composed, however, are attested as well-formed syllables. Indeed, some of them are just accidental gaps, but others are unattested because they are ill-formed. This suggests that JSL has some phonotactics (i.e., a branch of phonology that deals with restrictions in a language on the permitted combinations of phonemes) just as oral languages do, but it has not yet been made clear how JSL phonotactics works in JSL syllable formation. One of the hurdles that make it difficult to clarify a mechanism of the JSL phonotactics is the heterogeneity of the syllabic components. The syllable-constituting elements, i.e., the handshape, the movement, and the location elements, are qualitatively different from one another. Unlike segments (i.e., phonemes) of oral languages, they seldom share visual (*vis-à-vis* aural), articulatory, or physical features that are cross-cutting through the components. Nevertheless, some elements in these heterogeneous components certainly do combine with one another to form well-formed syllables. Observing attested combinations, or well-formed syllables, we find that there are dynamic relationships among componential elements. They seem to interact with one another to form well-formed syllables. In this chapter, we will see some examples of how elements in the heterogeneous components interact with one another, explore what makes componential elements interact and the role that this interaction plays in JSL syllable formation, and shed light on mechanisms of JSL phonotactics. In this process we will draw on the concept *information* used in information theory. We will devote a sufficient number of pages to the explanation of what information is before getting into a deep discussion.

2 Typology of syllables

Interaction among componential elements was first observed and described by Battison (1978). At that time, componential elements were thought of as direct con-

stituents of the sign (Stokoe 1960). In other words, early sign language linguists considered that the sign was constituted directly by one or two movement elements, handshape elements, and location elements. However, researchers such as Brentari (1998), Corina (1990, 1993, 1996), and Coulter (1982) have pointed out that the sign is not directly composed of those elements but of syllables, which themselves are composed directly of phonemic elements. This is because some signs, if not many, consist of two or more sequential units that are each composed of handshape, location, and movement elements, none of which is, however, a sign or a morpheme. They are entities larger than constituent elements (or phonemes) but smaller than morphemes or signs. They are considered syllables in sign language. What, then, is a syllable? It is, as mentioned previously, a unit that is composed of one or two elements from each of the three components, a central role of which is played by movement (Brentari 1998). That is, the movement defines the syllable: the onset and coda of the movement each corresponding to the onset and coda of the syllable.

Now we would like to examine the two conditions and the typology of syllables that Battison has proposed. They seem to describe examples of the intercomponential interactions to be discussed in this chapter. Note that, although his discussions on them are word- or morpheme-based, we will use the term *syllable*.

Traditionally, syllables are categorized according to the number of hands involved in forming them: roughly speaking, we have one-handed syllables and two-handed syllables (Battison 1978). One-handed syllables are called type 0. They are those executed by one hand (usually the dominant one). Two-handed syllables are sub-categorized into three types. Because both hands are anatomically and physiologically independent of each other, each hand could have any kind of handshape, movement, and location regardless of what handshape, movement, and location the other hand may have. The fact is, however, that not all possible combinations are allowed. Indeed, combinations of two hands are severely restricted. The most well-known conditions on the combinations of two-handed syllables are Battison's Symmetry Condition and Dominance Condition as in (1). (Note that in the quotation the term *sign* remains intact not to distort the original definitions.)

- (1) Battison's conditions: the Symmetry Condition and the Dominance Condition
 1. The Symmetry Condition
 - (a) If both hands of a sign move independently during its articulation, then
 - (b) both hands must be specified for the same location, the same handshape, the same movement (whether performed simultaneously or in alternation), and the specifications for orientation must be either symmetrical or identical.

2. The Dominance Condition

- (a) If the hands of a two-handed sign do not share the same specification for handshape (i.e., they are different), then
- (b) one hand must be passive while the active hand articulates the movement, and
- (c) the specification of the passive handshape is restricted to be one of a small set: A, S, B, 5, G, C, O. (Battison 1978: 33–35)

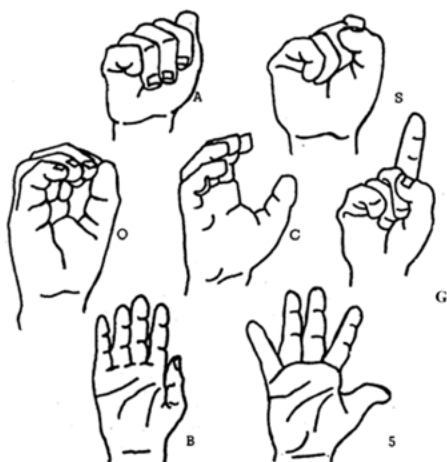


Figure 1: Handshapes on nondominant hand specified in the Dominance Condition (Battison 1978: 35)

Syllables to which the Symmetry Condition applies are dubbed type-I syllables while syllables to which the Dominance Condition applies, type-III syllables. Type-I syllables are those in which both hands have identical handshapes, moving in the same manner and in the same location. Type-III syllables have two different handshapes on the dominant and nondominant hands, respectively, and only one of the two can move: the nondominant hand remains still while the dominant hand moves. There is another type of two-handed syllable which Battison's conditions do not cover, which is the type-II syllable: the type-II syllable has the identical handshape on both hands, but one hand remains still while the other moves. Battison's typology of two-handed syllables is shown in (2), in which the term *sign* remains as in the original.

(2) Typology of Two-handed Syllables (Battison 1978: 28–29)

Type I: Two-handed signs in which both hands are active and perform identical motor acts; the hands may or may not contact each other, they may or may not contact the body, and they may be in either a synchronous or alternating pattern of movement.

Type II: Two-handed signs in which one hand is active and one hand is passive, but both hands are specified for the same handshape.

Type III: Two-handed signs in which one hand is active and one hand is passive, and the two hands have different handshapes.

The Symmetry Condition and the Dominance Condition were both originally proposed for American Sign Language, but they also apply to JSL to a large degree, and many JSL syllables can be categorized into type I through type III as in Figure 2.

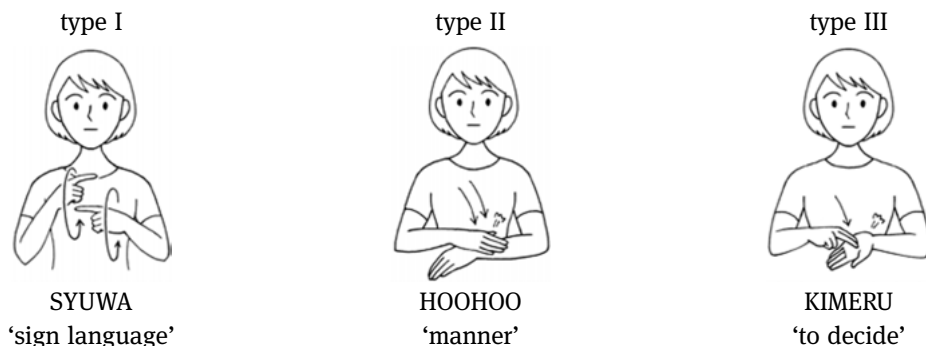


Figure 2: Examples of JSL type-I, type-II, and type-III syllables (monosyllabic signs)

As for JSL type-III syllables, Battison's seven handshapes that appear on the nondominant hand are also the top seven handshapes. Note that the Dominance Condition implicitly leads us to hold the image that the seven nondominant handshapes occur evenly throughout type-III syllables, but that is not case. Table 1 shows how frequently they appear in the lexicon: the distribution is heavily unbalanced (Hara 2003). Hara counted the number of nondominant handshapes of type-III syllables listed in *Nihongo-Shuwa Jiten* [Japanese-Japanese Sign Language Dictionary] (Japan Institute for Sign Language Studies 1997) and calculated their relative frequencies. The table reveals an intriguing fact: the B-handshape is the overwhelmingly most frequent of nondominant handshapes, and accounts for more than 50% while the second most frequent handshape, the A-handshape (handshape with all fingers closed and the thumb fully extended), accounts for about 8% of the nondominant handshapes. This is less than one sixth of the number of the B-handshape. There is, however, a difference in JSL syllable typology shown in Table 1 from the ASL counterpart shown in Table 2, as we have more variety in nondominant handshapes of the JSL type-III syllables. While ASL has eleven nondominant handshapes, JSL has twenty-five different handshapes on the nondominant hand.

Table 1: Distribution of the JSL type-III nondominant handshapes

Type-III Nondominant Handshapes (JSL)												
B	A	S	C	1*	5	O	L-f	F	B4-f	Y	5-b	
295	47	46	39	30	19	11	9	9	8	8	7	
51.5%	8.2%	8.0%	6.8%	5.2%	3.3%	1.9%	1.6%	1.6%	1.4%	1.4%	1.2%	
Type-III Nondominant Handshapes (JSL) (continued)												
U	I	B-f	L-b	V	B-b	3	L	1-b	W	B4	V-b	4
7	7	5	5	4	4	3	2	2	2	2	1	1
1.2%	1.2%	0.9%	0.9%	0.7%	0.7%	0.5%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%

Table 2: Distribution of the ASL type-III nondominant handshapes

Type-III Nondominant Handshapes (ASL)											
Battison's Seven Handshapes							Others				
B	1*	S	O	5	C	A	H	V	L	I	
217	41	19	16	15	11	7	5	4	3	2	
63.8%	12.1%	5.6%	4.7%	4.4%	3.2%	2.1%	1.5%	1.2%	0.9%	0.6%	

* “1” is used to represent the G-handshape here and hereafter.

3 Syllable formation in sign language

3.1 Interaction among components

The Dominance Condition and the Symmetry Condition state relationships between the dominant and the nondominant hand. From a different perspective, however, we can see them as results of interactions among the dominant and nondominant hand in two-handed environments. The dominant hand and the nondominant hand are both physically independent and could have their own handshapes, movements, and locations to some extent, if not fully independently. They do not behave independently at all, however. Indeed, they both cooperate in some way to form a well-formed syllable. Where they cooperate, the nondominant hand is subject to much stricter constraints on the choices of elements than the dominant hand, although the latter cannot enjoy full freedom in choosing componential elements, either. In the type-I syllable, for instance, the nondominant hand can only have the handshape, movement, and location identical to those of the dominant hand: that is, it depends on the dominant hand what kind of handshape, location, and movement it can have, and it cannot decide its own componential elements. The dominant hand, however, cannot have all kinds of componential elements that would be available, either. See Figures 3 and 4, which describe the relationship between the handshape and the location in type-0 and type-I syllables respectively. In those

figures, elements of one component are arranged according to frequency of appearance on the horizontal line, with the most frequent element the leftmost and the least frequent the rightmost. Elements of the other component on the rectangular coordinate, on which the most frequent is the backmost and the least frequent the most forward. The vertical line represents the number of combinations. Comparing these two figures, we can find interesting differences between them. First, the number of handshapes and the number of locations available to syllable formation dramatically decrease in type-I syllables compared to those in type-0 syllables. Especially, this tendency is prominent in the locations of the type-I syllables: there is virtually only one location that is available for the type-I syllable. The second noteworthy point, which is related to the first, is that componential elements that occur in type-0 syllables have much more variety in terms of frequency than those in type-I syllables. They range from those with high frequency to those with lower frequency. As for handshapes, almost half the kinds of handshapes do not appear in type-I syllables, and all of them are less frequent handshapes. It seems from these observations that handshapes and locations interact in some way in more complex environments such as two-handed syllables. These are more complex because the number of componential elements involved is doubled in comparison to those like one-handed syllables.

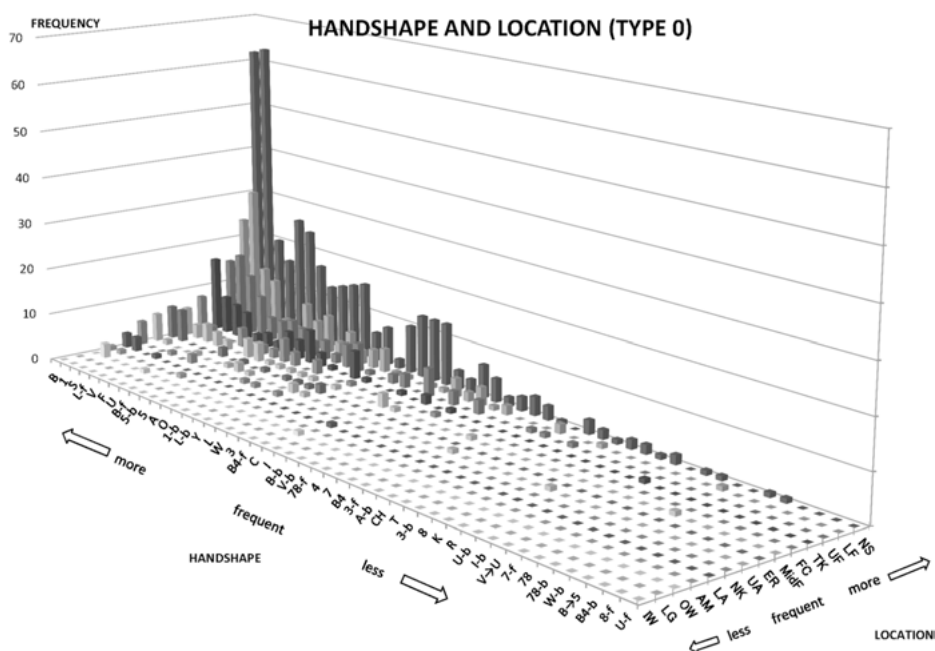


Figure 3: Handshape and location (TYPE 0)

NS ... neutral space, LF ... lower face, UF ... upper face, TK ... trunk, FC ... whole face, MidF ... middle face (nose), ER ... ear, UA ... upper arm (forearm), NK ... neck, LA ... Lower Arm, AM ... arm, OW ... outer wrist, LG ... leg, IW ... inner wrist

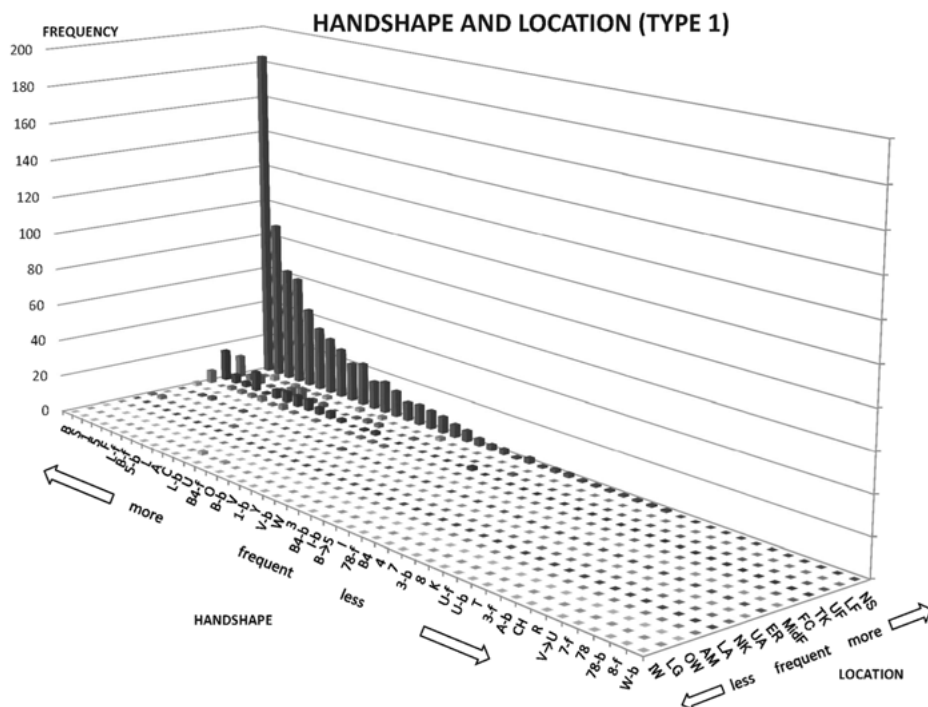


Figure 4: Handshape and location (TYPE I)

The tendency for componential elements with less frequency not to be involved in the syllable formation in complex environments holds combinations of handshape and movement elements and those of location and movement elements as well. See Figures 5 and 6, which show the location-and-movement combinations in type-0 syllables and type-I syllables respectively. In those syllables, movements with less frequency tend to combine with locations with higher frequency such as the neutral space, the upper face, and the whole face, and elements with lower frequency in both components do not combine each other.

In the most complex environments, like type-III syllables, interactions among componential elements can be seen more obviously. Different from other two-handed syllables, type-III syllables have nondominant handshapes that are different from the dominant ones as shown in Table 1. This influences the choices of other componential elements. Put another way, both hands having different handshapes is possible at the sacrifice of, or in association with, the other elements. Let us see how componential elements interact in the type-III syllable formation.

First, the availability of handshapes for the nondominant hand is restricted. As shown in Table 1, the range of handshape choices is narrower than for the dominant hand. While more than 40 kinds of handshapes are available for the dominant hand,

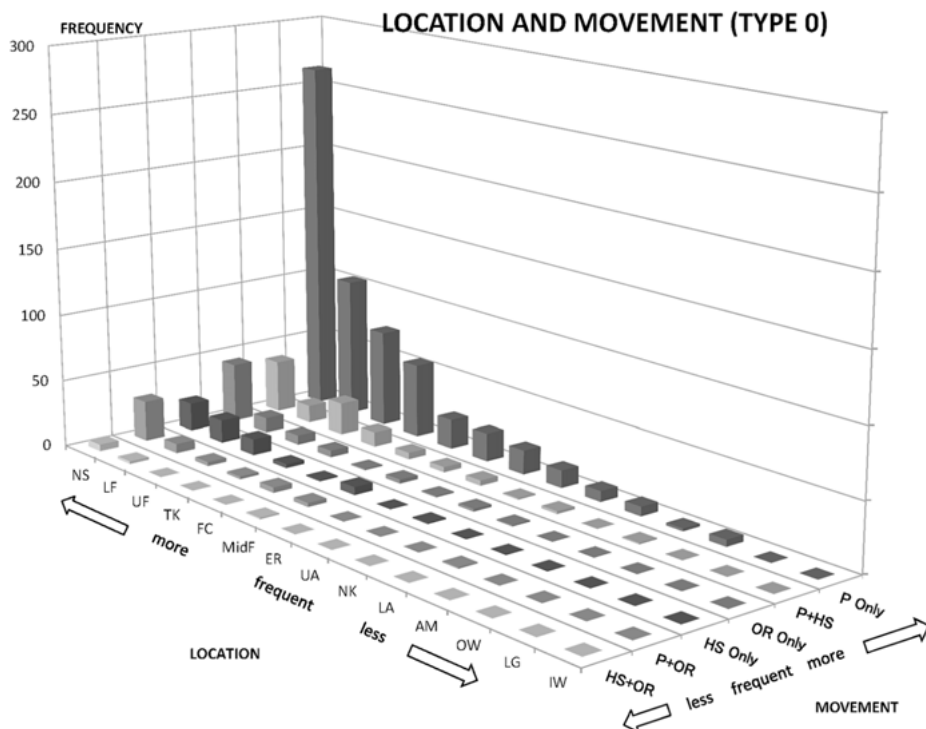


Figure 5: Location and movement (TYPE 0)

P... path movement, HS... handshape change movement, OR... handshape orientation change movement, P+HS... path movement with concurring HS, P+OR... path movement with concurring hand orientation change movement, HS+OR... handshape change movement with concurring hand orientation movement

the nondominant hand can only have 25. What is more, those 25 handshapes do not occur evenly. More than half of the JSL type-III syllables have the B-handshape on the nondominant hand, and the frequencies of the others are less than 10 percent each. Battison's seven handshapes, which are the top seven handshapes in JSL as well, account for more than 80 percent of all nondominant handshapes. These facts suggest that there should be reasons for the asymmetrical distributions, one of which might be interactions between the dominant and the nondominant hand. Indeed, the ways in which the dominant and nondominant handshapes combine are not uniform and are incomplete. See Figure 7. This illustrates combinations of the dominant and nondominant handshapes of type-III syllables, in which dominant and nondominant handshapes are arranged according to frequency on the horizontal and rectangular coordinates respectively. On the horizontal coordinates, the most frequent dominant handshape is the leftmost and the least frequent the rightmost. On the rectangular coordinates, the most frequent nondominant handshape is the

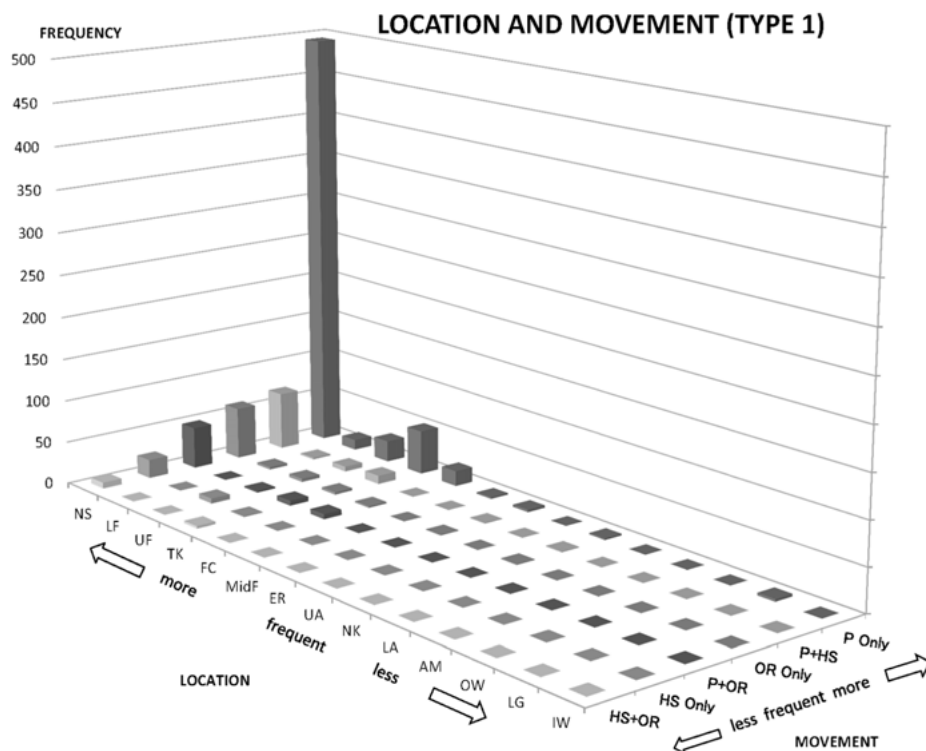


Figure 6: Location and movement (TYPE I)

backmost and the least frequent the most forward. The vertical line represents the number of combinations. As is clear, the nondominant B-handshape combines with most of the dominant handshapes, and as the frequency of the nondominant hand gets lower, the kinds of dominant handshapes available to be combined get fewer: dominant handshapes which combine with nondominant handshapes with lower frequency tend to be those that have higher frequency. This tendency is also true for the dominant handshape. That is, while the handshape with less frequency, whether it is a dominant or nondominant handshape, tend to be avoided, the one with more frequency to be adopted more often when both hands combine.

Second, the location component also participates in interactions in the type-III syllable formation, although it has not been clearly pointed out in previous studies. Just as in the type-I syllable, the nondominant hand of type III must be represented in the same location as that of the dominant hand. No nondominant hand can occur in a location nonidentical with that of the dominant hand. Different from type-I syllables, however, locations of the dominant hand (and as a corollary, locations of the nondominant hand) of type-III syllables are also severely restricted. More than 95% of the type-III syllables are represented in the neutral space, which is the space

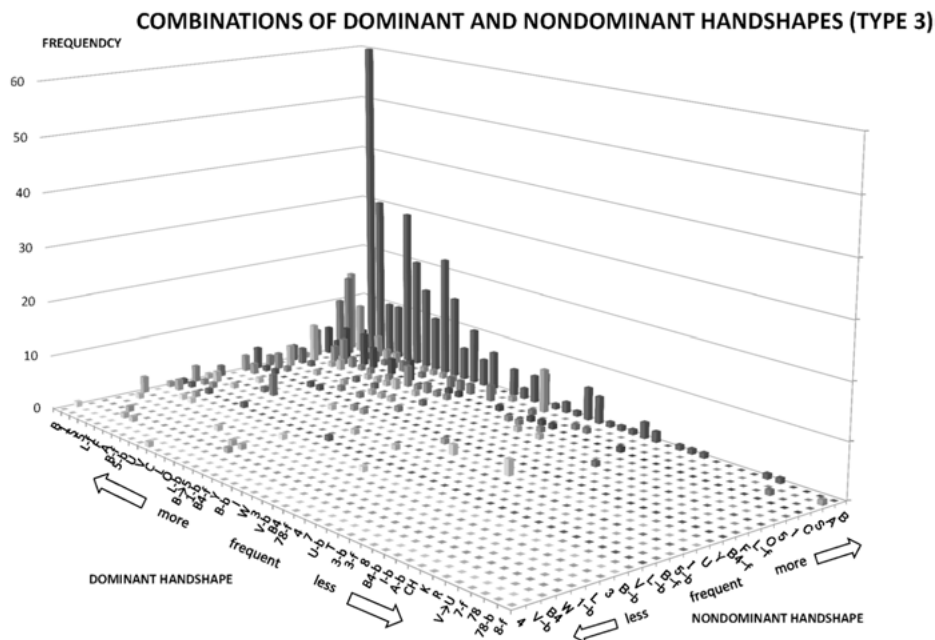


Figure 7: Combinations of the dominant and nondominant handshapes of type-III syllables

approximately 10 inches away from the front of the signer's body. This neutral space is the most frequently used location of all the 14 locations.

Third, as we already know from the Dominance Condition, the movement component is also severely restricted in the type-III syllables. The nondominant hand is motionless while the dominant hand moves.

To summarize what we have discussed above, the nondominant hand of the type-III syllable does not have to have the same handshapes as the dominant hand, although the range of available handshapes is limited. In exchange for this freedom, it waives choices for movement and location. This is reminiscent of interactions or constraints in the type-I syllables, in which the nondominant hand can move in several ways, have various kinds of handshapes, and appear in some different locations but does not have any option to decide what kind of movement, handshape, or location since they are subject to the dominant hand. What is common in those types is that elements in each of the three components do not combine at random, but are subject to some restrictions when forming JSL syllables, or in other words, they do not behave independently but are intimately entangled with one another.

3.2 Phonotactics

We have seen interactions among componential elements apparently playing a certain role in JSL syllable formation, and it seems that clarifying the mechanism of

the interactions will be a key to clarifying the mechanism of the syllable formation in JSL. We expect the mechanism to be something like phonotactics in oral languages, which regulates what element in one component can or cannot combine with an element in another component. We will, however, quickly find it not as easy to tackle this problem as in oral languages because we do not have any reliable intersectional measure like acoustic or articulatory features used in oral languages, which is applicable to all the componential elements, or the JSL phonemes. The biggest hurdle that we have to overcome is the problem of the heterogeneity of the components. As mentioned above, a syllable is composed of at least three different componential elements such as the handshape, the movement, and the location elements. Needless to say, they are all qualitatively different, i.e., heterogeneous. Different from phonemes of oral languages, they seldom share anything articulatory or visual (equivalent to acoustic) in common to apply. It seems almost impossible to find any intersectional physical or qualitative feature on the same grounds. It is true, however, that elements in the components certainly do interact with one another as if they have a basis on which they can interplay. Discovering this basis and overcoming the heterogeneity among the components will be a necessary step towards shedding light on the interactions among the components and eventually clarifying the syllable formation in JSL.

Is there any way to homogenize qualitatively different components to enable us to treat them in a uniform manner? One of the clues is to understand the ways in which componential elements interact. As observed in the previous section, the interactions seem to be trade-offs: one component sacrifices its freedom for another component's diversity. A more frequent element combines with a less frequent element as if they offset the difference in frequency between them, and it is not the case that all the elements constituting a syllable are the ones with low frequency. Moreover, the more constituent elements a syllable includes, the less diverse the componential elements available for syllable formation are, and the more frequent elements survive the others. The type-III syllable, for instance, includes more constituent elements in a single syllable than the type-0 or type-I syllable. This leads us to the idea that structural complexity of the syllable and the frequentness or commonness of componential elements involved in the syllable are strongly related. (In this context, the term *complexity* means the amount of load with which a syllable is burdened: a syllable represented by two hands, for example, is a complex syllable because it includes more than one hand and thus has more componential elements than a simple one.) It is as if frequentness or commonness of constituent elements compensates the structural complexity. Since frequency, which is uniformly represented by the mathematical value, is universal among the elements in all the components, and is apparently related to structural complexity of the JSL syllable, we should deal with a mechanism of JSL syllable formation based on elemental frequency and syllabic complexity. We thus explore this possibility in the following sections.

3.3 Information-based approach to JSL syllable formation

Here we aim to develop a mechanism which elucidates JSL syllable formation based on frequency of syllable-constituting elements. Frequency per se, is, however, difficult to handle, and we thus use *information* as the primitive unit instead of frequency per se. This is why we call the approach which we are aiming for here *information-based approach*. We should, therefore, know the relationship between frequency and information, and what information is.

Information is represented as a mathematical function of frequency, and is a measure of uncertainty or unpredictability in Information Theory, in which *information* (E) is expressed as a function of the frequency of an event E . More correctly, information is a function of the *probability* of an event E , and in the light of our discussion, the frequency of a componential element can be identified as the probability. This is because what we have found as the frequency of a componential element is virtually equal to what is called empirical probability. Now, again, let us define information in this context. The information of an event E , i.e., *Information* (E), is a function of the probability of an event E , i.e., $P(E)$, and is mathematically represented as the negative logarithm (to the base 2) of the probability as in (3).

$$(3) \text{ Information } (E) = -\log_2 P(E)$$

It follows from this equation that if we know the probability of an element, for instance, the probability of the B-handshape, then we can find the information of the element.

Now, let us think of what probability represents. It represents how frequently (or infrequently) an event E occurs in the whole population. The probability of an event such as a handshape element shows how likely (or unlikely) the event is to occur in the JSL lexicon. We do not know, or cannot specify, how many times any specific element occurs in the JSL lexicon. We can, however, predict the likelihood for it to occur, i.e., the probability of the element (which is represented as $P(E)$), by specifying as a representative of the whole population the sample space, which is a set that has a countable, i.e., finite, number of elements. As such, we have specified *Nihongo-Shuwa Jiten* as the sample space (i.e., corpus) for JSL in this research. $P(E_i)$ is found by dividing the number of occurrences of an element E_i , which is represented as $COUNT(E_i)$, by the number of occurrences of all the elements in the component C_j to which the element E_i belongs, represented as $ALL(C_j)$ as in (4).

$$(4) \text{ Probability of an Element } E_i$$

$$P(E_i) = \frac{COUNT(E_i)}{ALL(C_j)}$$

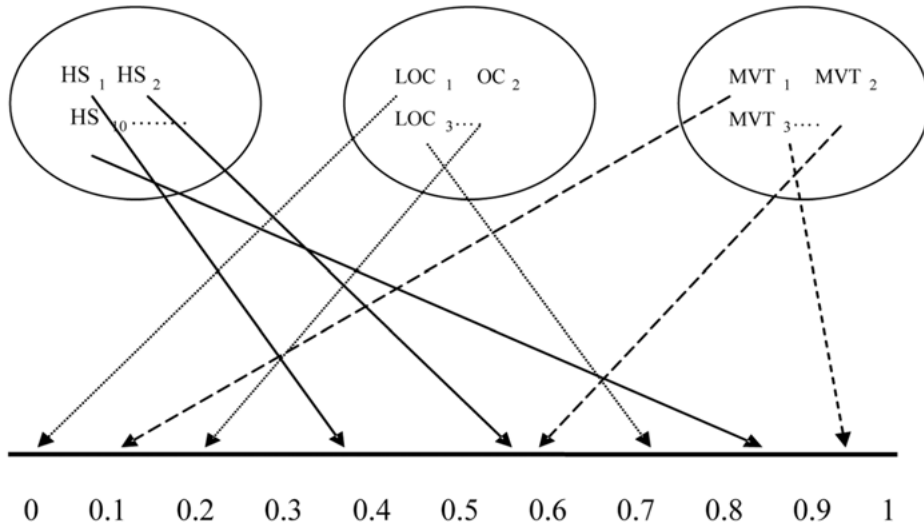


Figure 8: Qualitatively different elements are homogeneously represented on the number line

By application of the equation in (4), we can find the probabilities of all the hand-shape, location, and movement elements that occur in the corpus. As probabilities are expressed by numbers between 0 and 1 by definition, all the elements in all the components will be eventually assigned numbers between 0 and 1 on a single number line. Namely, the elements in qualitatively different components will all be represented quantitatively in a uniform manner. This is schematically shown in Figure 8.

Once we successfully represent all the componential elements as numbers between 0 and 1, we can find their information by using these numbers. Before we calculate the information of each componential element, let us think of what information is. Here, we would like to think of the relation between probability and information. As we have mentioned, information is a measure to represent uncertainty or unpredictability. The more uncertain it is that some event occurs, the more information the event has and vice versa. Let us see simple cases that show the relation between uncertainty and information. Here, let us think of the weather in three imaginary countries. First, suppose that you live in a country in which you have a sunny day and a rainy day “fifty-fifty”, i.e., with the probability of $1/2$ each. Sunny days and rainy days are equally likely in the country. It is difficult to guess correctly with certainty what the next day’s weather will be like. Next, let us suppose that you live in another country in which you have five fine days and two rainy days in the week. People living in this country would be more certain about what weather they would have on the next day than those living in the “fifty-fifty” country. If you say “It will be a sunny day tomorrow”, your prediction will be right about seven

times out of ten, or, more correctly, with the probability of 5/7. Finally, suppose an extreme case in which you live in a country which only has sunny days. In this country you would never have rain, and thus be 100% sure that it will be sunny on the next day. Now, let us think of these examples in the light of information. According to Shannon (1963), information is a measure of uncertainty, and the more uncertain a thing or an event is, the more information it has. That is, the amount of information gets larger proportionally as the amount of uncertainty does. Let us apply this notion to the three imaginary countries. In the “only-sunny-day” country you are 100% certain that you will have a sunny day on the next day. In other words, there is no uncertainty about the weather. Since the amount of information is directly proportional to the degree of uncertainty, there is no information if there is no uncertainty. Put it another way, you will not get any new information about it being a sunny day on the next day even if somebody or a weather forecaster says to you, “It will be sunny tomorrow.” This is because you are already sure about that. Second, in the case of the country where you have a sunny day with the probability of 5/7, you have some uncertainty about having a sunny day on the next day although you are still about 70% certain that it will be sunny tomorrow. That is, you have a bit more uncertainty about it being sunny on the next day than in the “only-sunny-day” country, and thus a weather forecast such as “it will be sunny tomorrow” would carry more information in the “five-in-seven” country. Third, thinking of information values in the “fifty-fifty” country in the same way, we will find that the event of it being a sunny day has more information than in the “five-in-seven” country because you can only guess fifty-fifty at most. As these examples show, if you are 100% certain that some event will occur, it provides no information, while if you are not sure about it, it will. Based on the above discussions, let us see information values of individual cases. First, the information of having a sunny day on the next day in the “fifty-fifty” country can be found by substituting its probability, which is 1/2, or .5, into the equation in (3). The result will be **one bit**. Note that the unit of information is “bit” when the base of the logarithm is 2. Second, information of the same event in the “five-in-seven” country will be .485 bit. See (5) for the details.

(5) Information of Having a Sunny Day in the “Five-in-Seven” Country

$$\text{Information} = -\log_2 5/7 = -(\log_2 5 - \log_2 7) = 0.485$$

Information of the same event in the “only-sunny-day” country can be also found in the same way: $\text{Information} = -\log_2 1 = -\log_2 2^0 = -0 \times \log_2 2 = 0$.

Now we know what probability is, what information is, and how we can find information of each componential element by using probability. We have here assumed that elements in the components each have their own information. How, then, can we find information of the syllable which is composed of componential elements? Since the syllable is a combination of componential elements, we can

assume that information of the syllable is the total sum of the information that its constituent elements have, as in (6). Note that there may be a possibility that any specific component is giving more information to a syllable. If this were the case, we would have to give more weight to the elements of that component, but, because we currently do not have any evidence to do that, it would be fair to assume that all the components contribute to information distribution equally.

(6) Information of the Syllable

$$\mathbf{INF}(\mathbf{SYL}_i) = \mathbf{INF}(\mathbf{E}_l) + \mathbf{INF}(\mathbf{E}_m) + \mathbf{INF}(\mathbf{E}_n) + \mathbf{C}$$

where $\mathbf{INF}(\mathbf{SYL}_i)$ represents information of the syllable, and $\mathbf{INF}(\mathbf{E}_l)$, $\mathbf{INF}(\mathbf{E}_m)$, and $\mathbf{INF}(\mathbf{E}_n)$ represent information of the handshape, location, and movement elements respectively. “C” at the end of equation represents a constant, which we discuss in the following sections.

In passing, the addition of logarithms is equal to the logarithm of the product of probabilities. For instance, the result of addition “ $\log_2 A + \log_2 B + \log_2 C$ ” is equal to the result of $\log_2 (A \times B \times C)$, in which A, B and C represent probabilities of componential elements. Thus, the multiplication of probabilities of componential elements means the probability of occurrence of their combination: that is, the probability of the syllable. Recall that we have assumed that syllable-constituting elements occur independently of one another. In other words, occurrence of an element is not conditioned by occurrence of another. A model of this type is called “unigram probability model.” In the current discussion, we are pursuing a unigram model, but keep in mind that with further research we could pursue a bigram or a trigram model in which the occurrence of one element is considered to be dependent on the occurrence of another.

Let us return to the discussion on the information of the syllable. As in (6), we have defined the syllable information as the addition of logarithms of the constituent elements. We have, however, two other things yet to discuss. One is the matter of the constant represented as C in (6). Finding information about the syllable, we add not only information of constituent elements but also information of features. We need features in order to avoid accumulating redundant information on the syllable. If we did not use features to calculate the syllable information, we would have to add all information values of the elements involved in syllable formation, some of which would be redundant as we will mention below. In the case of the two-handed syllable such as the type-I syllable, for instance, we would add information values from the handshape, location, and movement of both hands. But do we really need all the information to be added to find information of the two-handed syllable? The answer is negative. If we know that the syllable is a two-handed one such as a type-I, type-II, and type-III, we will be certain that the location of the nondominant hand is identical with that of the dominant hand. Likewise, if we know that both hands of the syllable move, we will be certain that the syllable is a type-I and thus

the nondominant hand has a handshape and movement identical to those of the dominant hand. Recall that a sunny day in the “only-sunny-day” country, where you have sunny days 365 days a year, has no amount of information, since an event without uncertainty deserves no information. Just as a sunny day in that country, given that the syllable is two-handed, the location of the nondominant hand does not give any information to the syllable of which it is a constituent, and, in addition, given that the syllable is a type-I, neither do the handshape nor movement of the nondominant hand have any information. In terms of information loading on the syllable, we must avoid accumulating redundant information, for example, from the location, handshape and movement of the type-I syllable which does not contribute to information building of the syllable. Given the information on whether a syllable is two-handed or one-handed, and, if two-handed, whether the nondominant hand moves or remains still, we can add just the right amount of information and forgo adding anything unnecessary. As such, we assume the feature [two-handed], and the feature [homokinetic]. The former provides the information on the hand(s) involved, and the latter on the motion. The latter presupposes the [two-handed] feature by definition. The plus- and the minus-valued [two-handed] features provide us with the information as to whether the syllable is two-handed or one-handed. If two-handed, then the plus- and the minus-valued [homokinetic] features distinguish two-handed syllables with both hands in motion from those with only the dominant hand in motion. These two valued features bear their own information values, which are found based on the probability in the same way that we find information values of componential elements. That is, the information of [+two-handed] is found by dividing the total number of two-handed syllables (i.e., 1719) by the total number of syllables listed in the corpus (i.e., 2608), and the information of [-two-handed] by dividing the total number of the one-handed syllables (i.e., 889) by 2608. Likewise, the information of [+homokinetic] is found by dividing the total number of two-handed syllables with both hands in motion (i.e., 875) by the total number of two-handed syllables listed there (i.e., 1719), while the information of [-homokinetic] by dividing the total number of two-handed syllables only with one hand in motion by 1719. By the way, in the early developmental stage of the information-based approach, we had another feature [homomorphic]. It presupposed the existence of the [+two-handed] feature as well, providing the information whether both hands of the syllable had identical or different handshapes: the plus-valued [+homomorphic] and the minus-valued [-homomorphic] features each distinguished the type-III syllable (two-handed syllable with different handshapes) and the type-II syllable (two-handed syllable with identical handshapes) along with the [-homokinetic] feature. In both cases, the nondominant hand remained still while the dominant hand moved. The feature [homomorphic] was adopted to find the information of the type-II and type-III syllables, and we actually found their information values. Different from what had been supposed, however, the results of our calculations suggested that type II should not be an independent category but be considered as a special case

Table 3: Information to be loaded

TYPE	INFORMATION							
	FEATURE SPECIFICATION		DOMINANT HAND			NONDOMINANT HAND		
	two-handed	homo-kinetic	HS	LOC	MVT	HS	LOC	MVT
0	– (1.55)	(N/A)	YES	YES	YES	(N/A)	(N/A)	(N/A)
I	+ (0.60)	+ (0.97)	YES	YES	YES	NO	NO	NO
III (incl. II)	+ (0.60)	– (1.03)	YES	YES	YES	YES	NO	NO

Table 4: Probability and information of handshake

TYPE	0	I	II	ND-II	III	ND-III	SUM	PROB	INF
HS									
B	155	225	169	169	63	295	1076	0.3113	1.684
1	140	77	19	19	114	30	399	0.1154	3.115
S	58	99	16	16	44	46	279	0.0807	3.631
5	35	79	8	8	27	19	176	0.0510	4.296
L-f	48	48	13	13	27	9	158	0.0457	4.452
F	42	49	3	3	39	9	145	0.0419	4.575
A	31	27	5	5	27	47	142	0.0411	4.606
B-f	38	46	6	6	25	5	126	0.0364	4.778
U	41	18	3	3	31	7	103	0.0298	5.069
5-b	37	40	2	2	14	7	102	0.0295	5.083
V	45	11	4	4	27	4	95	0.0275	5.185
C	12	22	4	4	10	39	91	0.0263	5.248
O	21	14	6	6	11	11	69	0.0200	5.647
8	2	1	0	0	1	0	4	0.0012	9.755
B4-b	0	3	0	0	1	0	4	0.0012	9.755
I-b	1	3	0	0	0	0	4	0.0012	9.755
A-b	3	0	0	0	0	0	3	0.0009	10.17
CH	3	0	0	0	0	0	3	0.0009	10.17
K	2	1	0	0	0	0	3	0.0009	10.17
R	2	0	0	0	1	0	3	0.0009	10.17
7-f	1	0	0	0	1	0	2	0.0006	10.755
78	1	0	0	0	0	0	1	0.0003	11.755
78-b	1	0	0	0	0	0	1	0.0003	11.755
8-f	0	0	0	0	1	0	1	0.0003	11.755
U-f	0	1	0	0	0	0	1	0.0003	11.755
W-b	1	0	0	0	0	0	1	0.0003	11.755
TOTAL	890	877	271	271	575	573	3457	1.000	

Table 5: Probability and information of location

	0	I	II	III	SUM	PROB	INF
NS	403	701	253	556	1913	0.7310	0.452
LF	154	17	4	12	187	0.0715	3.807
UF	118	43	1	2	164	0.0627	3.996
TK	76	75	6	3	160	0.0611	4.032
FC	33	26	1	0	60	0.0229	5.447
MidF	38	2	0	3	43	0.0164	5.927
ER	23	5	1	0	29	0.0111	6.496
UA	17	0	0	2	19	0.0073	7.106
NK	11	4	0	0	15	0.0057	7.447
LA	8	0	2	3	13	0.0050	7.653
AM	3	0	1	1	5	0.0019	9.032
OW	5	0	0	0	5	0.0019	9.032
LG	0	3	0	0	3	0.0011	9.769
IW	0	0	1	0	1	0.0004	11.354
TOTAL	889	876	270	582	2617	1.000	

NS ... neutral space, LF ... lower face, UF ... upper face, TK ... trunk, FC ... whole face, MidF ... middle face (nose), ER ... ear, UA ... upper arm (forearm), NK ... neck, LA ... Lower Arm, AM ... arm, OW ... outer wrist, FA ... forearm, LG ... leg, IW ... inner wrist

Table 6: Probability and Information of Movement

	0	I	II	III	SUM	PROB	INF
P Only	591	610	216	432	1849	0.709	0.496
P+HS	104	88	12	56	260	0.100	3.326
OR Only	75	75	20	42	212	0.081	3.621
P+OR	50	63	18	29	160	0.061	4.027
HS Only	61	29	4	13	107	0.041	4.607
OR+HS(HS+OR)	8	10	0	2	20	0.008	7.027
TOTAL	889	875	270	574	2608	1.000	

P ... path movement, HS ... handshape change movement, OR ... hand orientation change movement (OR). A + B ... A and B executed simultaneously.

of type III in terms of syllable formation. Leaving the detailed explanations to Hara (2003) due to limitations of space, we will here take the position that type II is a special case of type III, in which the nondominant handshape of type II happens to be identical with the dominant one. In other words, the type-III syllable typically has different handshapes on both hands while there are some cases in which the handshapes of the dominant and nondominant hand coincide. This position allows us to do without the feature [homomorphic]. Also, as a corollary of this change, we will

load the information of the nondominant handshape of the old type-II syllable (which is now a special case of the type-III) because it is impossible to predict, from the dominant handshape, what handshape the nondominant hand will have. Remember that something uncertain has some information: i.e., uncertainty is directly related to information. Since the nondominant handshape of the old type-II syllable has uncertainty, we need to take its information into consideration when we build information of the syllable. Table 3 shows exactly what information should be accumulated to find the total amount of information that a syllable bears.

Tables 4, 5, and 6 show some, if not all, information values of handshapes, locations, and movements respectively.

3.4 Results of syllable information calculation

In the previous sections, we have seen some examples in which componential elements interact with one another and the interactions seem to be in trade-off relationships, as if one component sacrificed its freedom for another component’s diversity, or as if frequentness of componential elements compensated for the structural complexity. We have focused on roles that frequency plays in the interactions, and attempted to theorize what function frequency serves in the syllable formation in JSL. Utilizing the information derived from frequency, we have quantified each componential element involved in syllable formation, which has made it possible to treat qualitatively different elements in a uniform manner. In this section, we will look at what an information-based approach reveals about interactions among componential elements, and about the syllable formation in JSL.

First, see Table 7, in which are shown information values of syllables with the highest to the fifth highest ones according to types. Note that type II is not an independent type anymore, although it is treated as if it is: the truth is, it is a special case of type III. Following the convention, however, we treat type II and type III separately for the sake of convenience.

From the data in the table, we can see interesting facts: the highest information values of all the types are strikingly similar in spite of the difference in type

Table 7: Highest to the fifth highest syllable information for each type

	TYPE 0	TYPE I	Former TYPE II	TYPE III
HIGHEST (N)	23.8427	18.6890	26.2423	25.0987
N-1	23.4361	18.3902	24.1452	23.0478
N-2	20.8427	18.3181	21.2481	22.1923
N-3	20.7221	18.2809	20.0865	21.2162
N-4	19.7221	18.1364	20.0544	21.0735

although the value of type I is a bit lower than the others. Note that even the highest information value is no greater than 26.3 bits. Recall that the unit of information is “bit” when the base of the logarithm is 2. That is, the information values of the JSL syllables attested do not exceed the value of approximately 26 bits. It is not especially surprising that the syllable has an upper limit on the amount of information since there is no way that any syllable can have an infinite amount of information. What we should pay attention to, instead, is the fact that the JSL syllables are confined to a much smaller information space than the theoretically possible one.

Recall that the highest information values of the handshape, location and movement elements are 11.755, 11.354, and 7.027, which are the W-b handshape (handshape with the index, middle, and ring fingers hooked at the first and second joints), the inner wrist, and the handshape-changing movement with the orientation-changing movement respectively (see Tables 4 to 6). It is physically quite possible to combine these three elements together to form a syllable-like segment. If the segment were a syllable, the amount of information would be 30.136 plus the [-two-handed] feature information 1.553, which would thus be 31.689. This is not far from the highest information values of the attested syllables. This value is, however, just for one-handed syllables. If two-handed, the value would be much higher, which would be something more than 40 bits, since the information of the nondominant handshape and some feature values would be accumulated. Comparing the information value of 26 bits to this theoretically, i.e., mathematically, possible maximum value, we can realize that the actual upper limit of the information of the JSL syllable is quite low.

We currently do not know the reasons why the upper limit is approximately 26. What is important is that there is a requirement to make the information of the syllable confined within a limited information space for some reason(s), which has yet to be clarified. It is also important that, in order to meet the requirement, interactions among components play a central role in the syllable formation of JSL. As we have seen, syllable-forming elements seem to be trying to stop syllables exceeding the upper limit of information in such a way that some element with high information combines only with one with low information. As we have seen in Figure 3, the location NS (neutral space), or the element with the lowest information of all the locations, combines with the widest variety of handshapes, while the variety gets poorer as the information of the location element gets higher. This is because the information of the NS is so small that even if it combines with an element with high information, the information of the combination is low enough to observe its upper limit. This is true of handshape elements. The B handshape, which has the lowest information of all the handshapes, has an affinity with almost all the locations, whereas handshapes with higher information are limited in their choice of partners.

Next, let us see in detail how effectively the componential interactions work in order to observe the upper limit of syllable information. Figure 10 shows how JSL syllables are distributed in the three-dimensional information space. On each axis

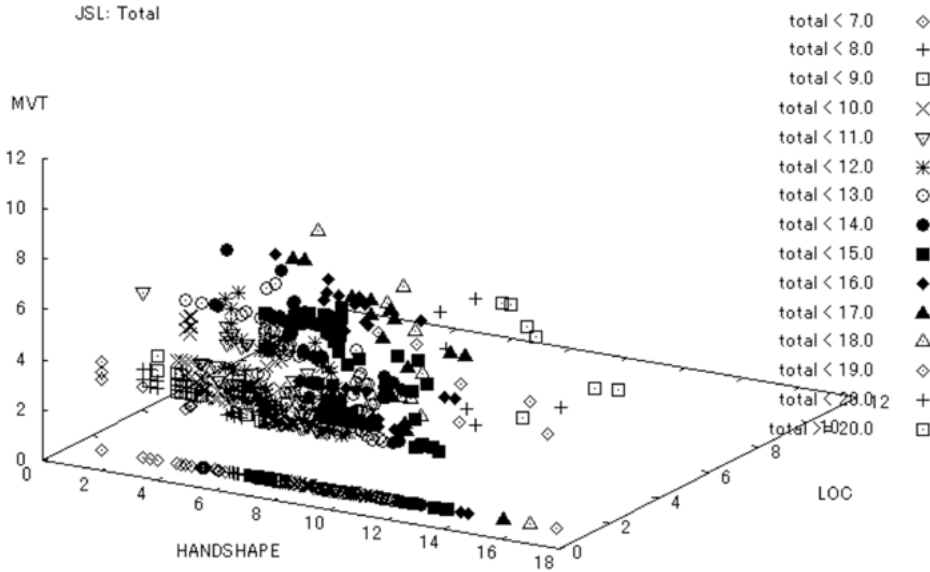


Figure 10: Graph of JSL syllable distribution

in the graph are plotted information values of the handshape, location, and movement elements, respectively. A syllable is dotted at the intersection of three information values on each of the three axes. For instance, if a syllable is composed of a handshape whose information is 1.5, a movement whose information is 2.3, and a location whose information is 2.8, then the syllable will be dotted at the intersection of the lines $x = 1.5$, $y = 2.3$, and $z = 2.8$. (Note that the graph does not include feature information values because we cannot incorporate the fourth dimension into a black and white graph.). As is expected, all the syllables are plotted in the space beneath or on the plane $x + y + z \approx 26$, i.e., the region bounded by the coordinate axes and this plane. See Figure 11 (left).

What is interesting is that syllables do not distribute evenly beneath the plane, but many of them are crowded in the sphere beneath the plane that is schematically drawn in Figure 11 (right). Put another way, this suggests that syllables with information equal or close to the maximum limit are rare and that many syllables have (much) less information than the maximum. This situation is manifest from the graphs in Figure 12, which indicate the distributional patterns of syllables according to types. Looking at the backmost row, which shows the distribution pattern of all the syllables in the corpus, we notice that syllables concentrate in the area between the values of seven and thirteen, and that the number of syllables dramatically decreases as the information increases. We can read from this that although syllables with high information such as those with more than 19 are possible, they are never canonical. Rather, many syllables tend to concentrate in the narrower area, and as

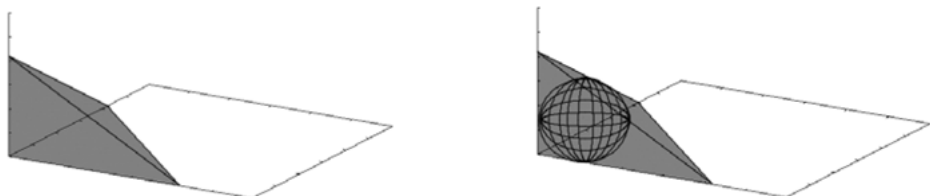


Figure 11: The area where the JSL syllables distribute

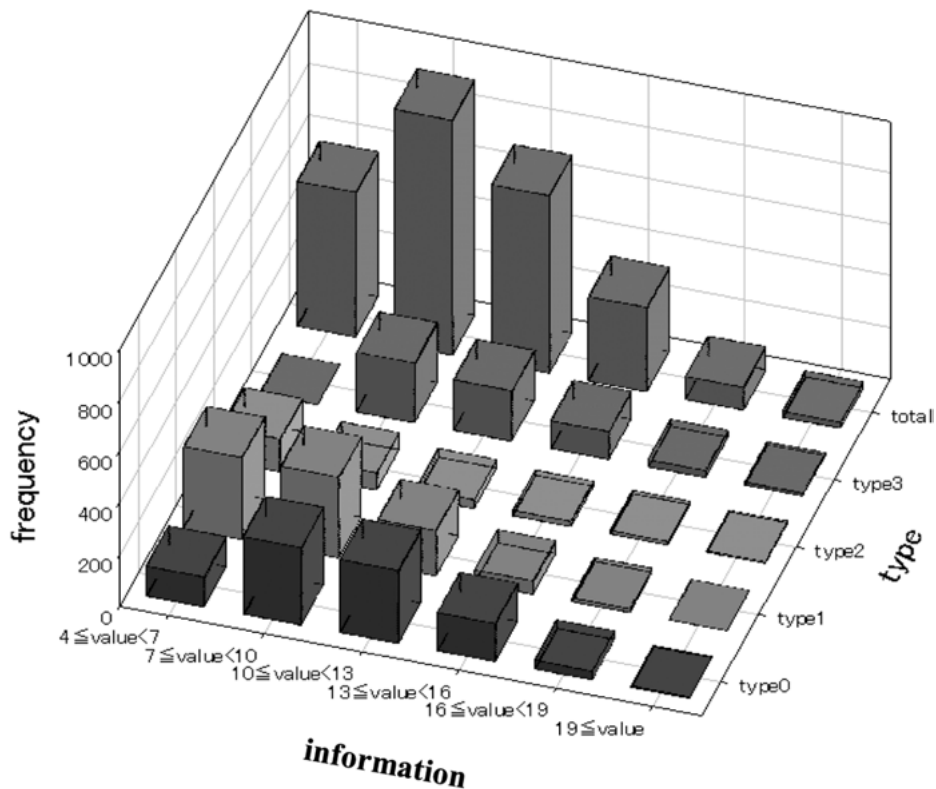


Figure 12: Distribution of all the syllables in JSL

information of the syllable gets further away from this area, their number decreases accordingly. It follows from what we have observed that the interactions among componential elements successfully function to confine the syllable information to the region far beneath the plane $x + y + z \approx 26$.

3.5 Maximum syllable information constraint

The discussions above have made it clear that JSL has set the upper limit of the syllable information at approximately 26 bits. That is, no syllable information can exceed this amount. Note that the limit is much smaller than the theoretically possible maximum value. We would like to call this constraint **the maximum syllable information constraint**. The information-based approach has revealed that the componential interaction found in the syllable formation of JSL is one of the strategies used to observe this constraint, keeping the syllable information within a certain value. Now that we have found part, if not all, of the functions that the componential interactions serve, we can realize that Battison's Symmetry Condition and Dominance Condition are actually only part of a larger phenomenon and that they are special cases of the componential interactions. We all have intuitively understood by experience that they are strategies not to make a syllable too complex. The componential interactions, however, had not been given a theoretically explicit explanation. One of the biggest obstacles preventing the clarification of the interaction was heterogeneity among the components. We did not have any measure that we could apply to heterogeneous componential elements in a uniform manner, but the information-based approach is now starting to pave the way for studying heterogeneous componential elements in a uniform manner.

We have just launched our attempt at explaining the phonotactics of JSL, and what we have done so far is merely to show, in terms of informational complexity, one of the ways to make a distinction between the syllables attested in the JSL lexicon and the nonexistent syllable-like segments which would be judged as ill-formed by the native signer of JSL. In reality, we have many problems yet to be solved. First of all, we do not know why the upper limit of syllable information is approximately 26 bits. Where does this value come from? To answer this question, we must tackle the problem by considering factors such as visual perception and recognition, brain processing, motor capability, anatomy and the like. Second, although the approach has shown us a way to distinguish between well-formed and ill-formed syllables, and has provided a better account for the range of well-formed syllables, there is much room for improvement. For instance, it mentions that any well-formed syllable of JSL has information less than, or at most equal to, 26 bits, but does not imply that all the syllables having the information value of 26 bits or less are well-formed. In fact, many syllable-like segments are not attested even if they have information of less than 26. Certainly, some of them might be accidental gaps, but not all of them are. We still have unexplainable gaps in the less-than-twenty-six region. For instance, what amount of information the dominant and nondominant hand account for in syllable information is related to the well-formedness of the type-III syllable (Hara 2008). This suggests that some, if not all, of the gaps regarding type III can be systematic rather than accidental. Namely, clusters of ill-formed syllables can creep into the region that the information-based approach predicts that only well-formed

syllables inhabit. The third is a problem of hand contact. Not being mentioned above, about 68 percent of the type-III syllables (including the old type II) involve hand contact while about 40 percent of the type-0 syllables and 42 percent of the type-I syllables involve hand contact in JSL. We have apparent asymmetry regarding hand contact in the JSL syllables. The information-based approach, however, cannot explain the asymmetry appropriately. There is no striking structural difference between the type-III syllables with or without hand contact. We could assume the feature [\pm contact] just like other features, but this would not make a significant difference in the results of the information calculation. Namely, the feature [\pm contact] would not explain the paucity of type-III syllables without hand contact. The second and third problems indicate that we will need to establish some other auxiliary principles or constraints that further narrow the range of the well-formed syllables. However, the necessity of other principles or constraints does not nullify the information-based approach or the maximum syllable information constraint. This approach has successfully provided a clear range for the well-formed syllables of JSL: i.e., it has succeeded in discriminating syllables from those that previous models assumed as well-formed. It is this distinction that invokes the necessity of auxiliary principles or constraints that should work in the region of less than 26 bits.

4 Conclusion

A syllable is composed of elements of at least three basic components, i.e., the handshape, movement, and location components. However, not all combinations of the legitimate componential elements exist as well-formed syllables. Looking at existing syllables, we have noticed that it is often the case that some componential element in one component requires some specific element in another component as its partner, and that they all band together to create a well-formed syllable. This has suggested that interactions among the components are a key to clarifying the mechanism of syllable formation in JSL. However, the three components are too heterogeneous to handle in a uniform manner. To overcome this obstacle, we have proposed an information-based approach which provides a way to treat qualitatively different components in a uniform manner, which can express all the elements and the attested syllables in bits. The results of our calculations have revealed that all the syllables attested have information values that are less than, or at most equal to, 26 bits, the upper limit being much less than the theoretically possible maximum. We have described this as “the maximum syllable information constraint.” We have found that one of the reasons why the componential elements interact when forming syllables is that they observe this constraint.

References

- Battison, Robin. 1978. *Lexical borrowing in American sign language*. Silver Spring, MD: Linstok Press.
- Brentari, Diane. 1998. *A prosodic model of sign language phonology*. Cambridge, MA: MIT Press.
- Corina, David. 1990. Reassessing the role of sonority in syllable structure: Evidence from a visual-gestural language. In Michael Ziolkowski, Lise Dobrin, and Karen Deaton (eds.), *CLS* 26(2), 33–44. Chicago, IL: Chicago Linguistic Society.
- Corina, David. 1993. To branch or not to branch: Underspecification in ASL handshape contours. In Geoffrey Coulter (ed.), *Current issues in ASL phonology* (Phonetics and phonology 3), 63–95. New York, NY: Academic Press.
- Corina, David. 1996. ASL syllables and prosodic constraints. *Lingua* 98(1–3). 73–102.
- Coulter, Geoffrey R. 1982. On the nature of ASL as a monosyllabic language. Paper presented at the annual meeting of the Linguistics Society of America, San Diego, California, 27–30 December.
- Hara, Daisuke. 2003. *A complexity-based approach to the syllable formation in sign language*. Chicago, IL: The University of Chicago dissertation.
- Hara, Daisuke. 2008. Sayū no shukei ga kotonaru nihon shuwa tango (taipu III) ni arawareru shukei ni tsuite [Handshapes of the JSL signs with different handshapes on both hands]. *Technical Report of IEICE* 107(555). 109–114.
- Japan Institute for Sign Language Studies (ed.). 1997. *Nihongo shuwa jiten* [Japanese Japanese Sign Language dictionary]. Tokyo: The Japanese Federation of the Deaf.
- Shannon, Claude E. 1963 [1949]. The mathematical theory of communication. In Claude E. Shannon and Warren Weaver (eds.), *The mathematical theory of communication*, 29–125. Urbana, IL: University of Illinois Press.
- Stokoe, William C. 1960. *Sign language structure: An outline of the visual communication systems of the American deaf*. (Studies in Linguistics. Occasional Paper 8). Buffalo, NY: University of Buffalo.

Noriko Imazato

19 Syntax of Japanese Sign Language

1 Introduction

The languages of Japan include native spoken languages such as Japanese and the Ryukyuan languages, and also one signed language called Japanese Sign language (JSL). The rather long history of linguistic research on Japanese is well recognized and has contributed abundant results to the linguistic literature. Unfortunately, JSL has long been ignored not only by ordinary Japanese people but also by most linguists, being misunderstood as just an unstructured aggregation of gestures, or pantomimes, or as simply arranged gestures articulated in the order of spoken Japanese sentences.

Compared with fruits of the study of Japanese, only a small number of linguistic facts of JSL have been explained, and even they seem to not be widely shared even among linguists. There is an endless list of questions to be answered including: Does JSL have a fixed word order? Is its structure different from or similar to that of Japanese? Are there any grammatical elements or specific constructions in JSL? If so, what kinds of elements are they? How have they emerged?

In order to answer these basic questions and develop an analysis of this visual language, it is necessary as a first step to review and summarize the results of linguistic surveys of JSL thus far. Therefore, one of the objectives of this chapter is, referring to the outcomes of previous studies, to try to give a sketch of JSL's typological status in terms of linguistic universals. The chapter then also introduces grammatical elements found in JSL and other signed languages, but not in Japanese and other spoken languages, such as classifiers and non-manual markers.

Another aim of this chapter is to show the developmental process of the grammatical elements in JSL; without such a developmental process, a signed language cannot be considered a full-fledged language. Among various elements, the chapter will take as an example the “imperative/cohortative” marker in JSL, which has never before received detailed linguistic investigation as far as the author of this chapter knows. The chapter presents and describes abundant data. Close observation and detailed analysis reveal the process through which a verb as a content word undergoes grammaticalization in a certain context, and becomes a grammatical marker. The chapter also seeks to elucidate the facilitation of this process, and discusses whether or not the process and its facilitation are the same as in spoken languages.

2 Results of previous research on JSL

2.1 Brief history of JSL linguistics research

In 1960 William Stokoe embarked on the linguistic study of American Sign Language (ASL), which had long been believed to be a visual coding of spoken English or even an elaborate pantomime. His efforts had an effect all over the world, and Japan was no exception. At the beginning stage, observations on JSL in the 1960s through the 1970s were unable to identify conventional word order, verb conjugations, and functional particles. Thus, early researchers concluded that JSL was not well-developed grammatically, or that JSL was not even a language (see, for example, Sato [1964] and Kamata [1973]). Yonekawa (1984: 202) claimed that JSL is an SOV language, which has been confirmed by subsequent researchers. Liddell (1980: 89) revealed that certain non-manual markers in ASL (e.g., facial expressions) function as grammatical markers. Recent observations on JSL have found non-manual markers (see also section 2.3.6). JSL is now recognized by not only researchers but also native JSL signers as an independent, unique, visual language developed and elaborated among the Japanese Deaf¹ community.

2.2 Typological status of JSL

Before proceeding to an explanation of some grammatical constructions in JSL, we will examine its typological status in accordance with Greenberg's linguistic universals² (Greenberg 1963, 1966), many of which are defined based on the sequential order of words (or phrases) classified in discrete syntactic categories. This is a very tough challenge for three reasons. First, the syntax of JSL has not been fully described yet, so we need to be content with an analysis based on the limited research results available at present. Second, JSL may lack some of the syntactic categories devised for spoken languages. For example in JSL, there is no discrete category of pre/postposition except the locative *PLACE* and the pointing (at a location) sign that may possibly be recognized as a postposition-like element. These elements follow nouns (4).³ There are no genitives (2, 5, 23). We also have great difficulty in distinguishing adjectives from verbs. Descriptive adjectives like expressions, or possibly relative clauses, and numerals usually follow nouns (18, 19, 24), while a

¹ The term 'Deaf' is capitalized in order to avoid confusion with the medical perspective on these people's hearing status. The term Deaf indicates people who use sign language as their first language, including even hearing people such as CODA (children of deaf adults.)

² For Greenberg's (1963, 1966) linguistic universals from #1 to #45, see http://en.wikipedia.org/wiki/Greenberg's_linguistic_universals.

³ The parenthesized numbers refer to the numbered list of Greenbergian linguistic universals given in Table 1 that are or may be relevant to the items under discussion.

small number of restrictive adjective-like expressions precede the nouns (19). Third, signs that are articulated by various body parts (e.g., both hands, mouth, face, head) often occur simultaneously with other signs. Non-manual adverbials (e.g., facial expressions) almost always occur simultaneously with verb- or adjective-like expressions (21). There also exist manually articulated adverbs. Some of them (e.g., *ALWAYS*) can precede verbs, whereas others (e.g., *YET*) follow verbs. Yes-no questions are differentiated from assertions by adding a question marker as a facial expression (8) at the end of the sentence (9, 10) without any inversion of statement order (11, 12). Subordinate verbal forms (e.g., V+*PURPOSE*) tend to precede main verbs (13, 15). Conditional clauses usually precede the conclusion (14). The inflected auxiliary verb (e.g., auxiliary verb for subject/object marking) tends to follow the main verb (16). Comparison of superiority is not expressed by order of standard, marker, and adjective (22). Relative expressions follow the noun (24). Neither pronominal objects nor nominal objects follow the verb (25).

How about the morphology of JSL? Researchers believe that they have found inflection (e.g., verb aspectual inflection according to aspect) (40) but not derivational affixes (26, 27, 28, 29 and 40) in JSL. The verbs do not have tense categories (30). Neither subject nor object nouns agree with the verb in gender (31, 32), or in number (33, 34, 35, 36, 37). There is no system of case marking (37, 38, 39, 41). JSL has pronominal categories involving at least two persons and numbers (42), but not gender (43, 44, 45).

Table 1 below shows the list of Greenberg's universals from #1 to #45, and a summary of our analysis of JSL.

Table 1: Typological status of JSL based on Greenberg's universals

#	Greenberg's universals	JSL
1	In declarative sentences with nominal subject and object, the dominant order is almost always one in which the subject precedes the object.	YES
2	In languages with prepositions, the genitive almost always follows the governing noun, while in languages with postpositions it almost always precedes.	–
3	Languages with dominant VSO order are always prepositional.	–
4	With overwhelmingly greater than chance frequency, languages with normal SOV order are postpositional.	YES?
5	If a language has dominant SOV order and the genitive follows the governing noun, then the adjective likewise follows the noun.	–
6	All languages with dominant VSO order have SVO as an alternative or as the only alternative basic order.	–
7	If in a language with dominant SOV order there is no alternative basic order, or only OSV as the alternative, then all adverbial modifiers of the verb likewise precede the verb.	NO

Table 1: (Continued)

#	Greenberg's universals	JSL
8	When a yes-no question is differentiated from the corresponding assertion by an intonational pattern, the distinctive intonational features of each of these patterns are reckoned from the end of the sentence rather than from the beginning.	YES
9	With well more than chance frequency, when question particles or affixes are specified in position by reference to the sentence as a whole, if initial, such elements are found in prepositional languages, and, if final, in postpositional.	YES?
10	Question particles or affixes, when specified in position by reference to a particular word in the sentence, almost always follow that word. Such particles do not occur in languages with dominant order VSO.	YES?
11	Inversion of statement order so that verb precedes subject occurs only in languages where the question word or phrase is normally initial. This same inversion occurs in yes-no questions only if it also occurs in interrogative word questions.	—
12	If a language has dominant order VSO in declarative sentences, it always puts interrogative words or phrases first in interrogative word questions; if it has dominant order SOV in declarative sentences, there is never such an invariant rule.	NO
13	If the nominal object always precedes the verb, then verb forms subordinate to the main verb also precede it.	YES?
14	In conditional statements, the conditional clause precedes the conclusion as the normal order in all languages.	YES
15	In expressions of volition and purpose, a subordinate verbal form always follows the main verb as the normal order except in those languages in which the nominal object always precedes the verb.	—
16	In languages with dominant order VSO, an inflected auxiliary always precedes the main verb. In languages with dominant order SOV, an inflected auxiliary always follows the main verb.	YES
17	With overwhelmingly more than chance frequency, languages with dominant order VSO have the adjective after the noun.	—
18	When the descriptive adjective precedes the noun, the demonstrative and the numeral, with overwhelmingly more than chance frequency, do likewise.	—
19	When the general rule is that the descriptive adjective follows, there may be a minority of adjectives which usually precede, but when the general rule is that descriptive adjectives precede, there are no exceptions.	YES
20	When any or all of the items (demonstrative, numeral, and descriptive adjective) precede the noun, they are always found in that order. If they follow, the order is either the same or its exact opposite.	YES?

Table 1: (Continued)

#	Greenberg's universals	JSL
21	If some or all adverbs follow the adjective they modify, then the language is one in which the qualifying adjective follows the noun and the verb precedes its nominal object as the dominant order.	–
22	If in comparisons of superiority the only order, or one of the alternative orders, is standard- marker-adjective, then the language is postpositional. With overwhelmingly more than chance frequency if the only order is adjective-marker-standard, the language is prepositional.	–
23	If in apposition the proper noun usually precedes the common noun, then the language is one in which the governing noun precedes its dependent genitive. With much better than chance frequency, if the common noun usually precedes the proper noun, the dependent genitive precedes its governing noun.	–
24	If the relative expression precedes the noun either as the only construction or as an alternate construction, either the language is postpositional, or the adjective precedes the noun or both.	–
25	If the pronominal object follows the verb, so does the nominal object.	–
26	If a language has discontinuous affixes, it always has either prefixing or suffixing or both.	–
27	If a language is exclusively suffixing, it is postpositional; if it is exclusively prefixing, it is prepositional.	–
28	If both the derivation and inflection follow the root, or they both precede the root, the derivation is always between the root and the inflection.	–
29	If a language has inflection, it always has derivation.	NO?
30	If the verb has categories of person-number or if it has categories of gender, it always has tense- mode categories.	–
31	If either the subject or object noun agrees with the verb in gender, then the adjective always agrees with the noun in gender.	–
32	Whenever the verb agrees with a nominal subject or nominal object in gender, it also agrees in number.	–
33	When number agreement between the noun and verb is suspended and the rule is based on order, the case is always one in which the verb precedes and the verb is in the singular.	–
34	No language has a trial number unless it has a dual. No language has a dual unless it has a plural.	YES
35	There is no language in which the plural does not have some nonzero allomorphs, whereas there are languages in which the singular is expressed only by zero. The dual and the trial are almost never expressed only by zero.	–
36	If a language has the category of gender, it always has the category of number.	–

Table 1: (Continued)

#	Greenberg's universals	JSL
37	A language never has more gender categories in nonsingular numbers than in the singular.	–
38	Where there is a case system, the only case which ever has only zero allomorphs is the one which includes among its meanings that of the subject of the intransitive verb.	–
39	Where morphemes of both number and case are present and both follow or both precede the noun base, the expression of number almost always comes between the noun base and the expression of case.	–
40	When the adjective follows the noun, the adjective expresses all the inflectional categories of the noun. In such cases the noun may lack overt expression of one or all of these categories.	NO
41	If in a language the verb follows both the nominal subject and nominal object as the dominant order, the language almost always has a case system.	NO?
42	All languages have pronominal categories involving at least three persons and two numbers.	NO?
43	If a language has gender categories in the noun, it has gender categories in the pronoun.	–
44	If a language has gender distinctions in the first person, it always has gender distinctions in the second or third person, or in both.	–
45	If there are any gender distinctions in the plural of the pronoun, there are some gender distinctions in the singular also.	–

–: Unapplicable

2.3 JSL grammar

In this section, we will introduce some of aspects of JSL grammar, focusing on differences between JSL and spoken languages, including Japanese.

2.3.1 Signing space (SS)

The majority of signs are articulated in the dimensional space in front of the signer. This area is called the signing space (SS). The SS is approximately the cubic area bounded by six planes: horizontal planes at the top of the head and at the waist, sagittal planes at the extent of the elbows on the dominant hand side and non-dominant hand sides, and the coronal planes at the signer's location and at the farthest reach in front of the signer. The distance between the signer and the location of a sign indicates physical and even psychological distance.

2.3.2 Pointing (PT)

When a signer establishes a sign at a particular location in the SS, pointing to the sign or its location acts as a pronoun. The pointing can refer to the sign, to participants in the discourse, to participants of the actual conversation, or to their locations. Generally, pointing at the signer indicates the first person (*PT1*), and pointing at the signer's front refers to the second person (*PT2*). Once a sign is produced, even after it is no longer in the SS, pointing at its former location can refer to the sign. Pointing can be used for other grammatical markers as well. Kimura and Ichida (1995: 28) claimed that *PT2* after the predicate verb is the imperative marker. Torigoe (1991) suggested that pointing to a noun at the end of a clause is a pronominal clitic indicating the subject of the clause.

2.3.3 Classification of verbs

Padden (1988 [1983]) argued that ASL verbs could be classified into three groups in terms of the (non-) existence of agreement: spatial, agreeing, and plain verbs. JSL verbs can basically be classified in the same way as ASL. Padden (1988) also analyzed ASL agreeing verbs as containing morphological inflections for person and number. In the literature on spoken languages, agreement of a verb is defined as the phenomenon that a verb takes a particular form corresponding to the person/gender/number of its subject or object. The verb *walk* in the English sentence 'She walks to the park' takes the form of *walks*, corresponding to its person (third person) and number (singular). On the other hand, agreement in sign language is the phenomenon that the starting point and end point of a handshape movement are required to coincide with particular locations in the SS as source and/or goal: locations where the subject and/or object are articulated. Are these two agreements of spoken and signed languages the same concept or do they need to be distinguished from each other? This question remains open. Mathur and Rathmann (2010: 174) take "the view that the phenomenon can be understood as agreement", but admit that there is disagreement among researchers. As for JSL, Ichida (2005b) casts doubt on the existence of agreement for person/number.

In order to avoid the confusion of terminology, we would like to call the agreement phenomenon observed in sign language "pseudo-agreement". In JSL, this pseudo-agreement phenomenon can be observed in spatial and agreeing verbs. First, when we move a handshape in the SS to produce a spatial verb, both the starting and end points of hand movement should coincide with the source and goal locations respectively. Verbs such as *GO*, *COME*, and *LEAVE* are typical examples. The verb *GO* in the sentence 'I go to school' has a handshape of a downward pointing index finger and moves it from the location of the subject (first person = signer) to the location of *SCHOOL* (*previously signed*). Location of the signer is the source of the movement and the location where *SCHOOL* is articulated is the goal of the move-

ment. If another new *SCHOOL* is established at another location in the discourse, the handshape of *GO* this time should move from the location of the signer to the new location changing the directionality of the movement. Should the handshape move in a direction other than the new *SCHOOL*, the sentence will be ungrammatical.

Second, examples of agreeing verbs include *GIVE*, *HELP*, and *BORROW*, among others. The starting and end points of the handshape movement of these verbs typically coincide with the location of the subject and indirect object respectively. In the JSL sentence 'I give you a book' the handshape of *GIVE* should move from the location of the subject (= signer) to the location of the indirect object (= you). The starting and end points of the handshape movement here seem to mark the first person subject and second person indirect object respectively. However description of only the coincidence between the handshape movement with the subject and indirect object alone is still insufficient as an explanation of the pseudo-agreement phenomenon of *GIVE*. The handshape of this verb actually represents 'a book' and this moving entity should shift from source to goal. The subject/object marking and source-to-goal movement happen as an identical path of handshape movement. The majority of agreeing verbs in this group behave in the same way, but there are some exceptions. Take *BORROW* in the sentence 'I borrow money from you,' for example. This is a ditransitive verb, taking three arguments: subject (= borrower), indirect object (= lender), and direct object (= money). The movement of the handshape of this verb always starts from the location of lender as indirect object and moves to the borrower as subject. This subject/object marking in terms of handshape movement is opposite from that of *GIVE*. However, its handshape movement coincides with the actual motion of 'money' in the SS as we have already observed in the example of the spatial verb *GO*. In this respect, *BORROW* is not an exception at all. Pseudo-agreement in JSL is essentially a different phenomenon from the agreement of spoken languages. This phenomenon is merely sometimes accidentally similar to agreement of spoken languages.

The third classification, plain verbs, usually express human action using the signer's whole upper body. For example, *RUN* will be expressed by the actual action of running. Verbs such as *EAT*, *WASH*, and *STUDY* also belong to this category. As these verbs do not include any movement of handshapes, there exist no pseudo-agreement phenomena with subjects or objects.⁴

2.3.4 Classifiers (CL)

Classifiers⁵ (CL) have likely been one of the phenomena that have attracted the most interest among sign language researchers. According to Emmorey (2003: ix)

⁴ In the case of plain verbs, subject marking will be expressed by pointing to a subject noun at the end of the clause, or the whole body will shift to the subject location.

⁵ Detailed discussion on confusion of terminology is omitted for reasons of space. For further discussion, see Emmorey (2003).

“classifier constructions can be analyzed as combinations of discrete morphemes, specifically, as predicates consisting of one or more movement routes along with several other morphemes encoding the shape or semantic class of object involved (indicated by handshape), the location of a referent object, and the orientation of the object”. The most typical CL would be the handshapes of spatial verbs, which describe the classification of the moving entity. In this section we will introduce some characteristics of CLs by taking some spatial verbs for an example.

In the sentence ‘A man walks from a to b,’ a signer will articulate an upright thumb, indicating a man, and move it from a to b. This handshape incorporated in the verb *WALK* is the CL, and can be replaced by many other CLs representing moving animate entities e.g., an upright human indicated with as upright index finger, a woman with a pinky finger, and two as a V sign, among others. CLs are not restricted to depicting only animate entities. In the sentence ‘A ball rolls from a to b’ the moving fist represents the round shape and size of the moving entity. The CLs in both the examples above should be wiggling while moving in order to represent the manner of motion (walking and rolling). When no CLs depicting moving objects are incorporated, the predicate will be *GO* or *COME* articulated simply as a downward index finger tracing the path of movement. Is this handshape a CL? We should point out that this handshape does not share significant characteristics with other CLs. It cannot represent any classification, or manner of motion of the moving entity, but only traces the path of motion.

2.3.5 Lexicalization

Ichida (2005a) explained the mechanism of lexicalization by taking a “frozen” word, *BE-SURPRISED*, as an example. The original word *JUMP* consists of motion upward in the SS as a base and ‘an inverted V sign,’ indicating an upright standing human, incorporated into the base. This combination of analyzable parts is conventionalized, the parts gradually transform and blend together, and become an unanalyzable whole. This brand new word *BE-SURPRISED* has a sense different from the original.

Because a frozen word is the final result of the gradual lexicalization process, there should be stages on the way. Actually, a closer look at the possible kinds of incorporated CLs shows that some words can allow various kinds of CLs to be incorporated, while others allow only one. *LEAVE* consists of two handshapes produced simultaneously, one of which represents the roof of a house, and beneath it the other handshape moves forward, expressing the gesture of moving away. This second handshape is interchangeable with many other CLs classifying moving entities. When the word means ‘to go on a business trip,’ only the CL indicating a male human can be selected. As base and CL are still distinguishable from each other, even though the CL is fixed, this word is on its way to be frozen.

2.3.6 Non-manual markers⁶ (NMMs)

Sign language signs are widely believed to be composed only of the activity of the hands. Liddell (1980: 12–13) pointed out, however, that signers must also “correctly configure the face and potentially other parts of the body” along with the activities of the hands. He used the term “non-manual signals (...) in order to be able to describe aspects of signing that go beyond the actions of the hands”.

Observations of JSL also confirm the importance of non-manual markers⁶. For example, NMMs (e.g., nodding for clause boundary, chin-upward for imperative marker, eyebrows-up for question marker) are accompanied by manual signs. The question arises, then of whether NMMs function as grammatical markers? Aren’t there any cases of manually produced content words developing into grammatical elements?

2.3.7 Grammaticalization

Hopper and Traugott (2003: xv) define grammaticalization “as the change whereby lexical items and constructions come in certain linguistic contexts to serve grammatical functions and, once grammaticalized, continue to develop new grammatical functions”. The following three changes can be observed in the process of grammaticalization: When a content word is grammaticalized, word (1) will lose its semantic content, (2) may lose some phoneme(s), and (3) will change into a grammatical element.

It is not so difficult to find research on grammaticalization in signed languages. Though limited only to research on the grammaticalization of the motion verbs *GO* and *COME*, Bos (1994) reported that the verb *GO-TO* in Dutch Sign Language had been grammaticalized and became an auxiliary verb to mark the verb agreement (in Padden’s sense), and Janzen and Shaffer (2002) indicate that the verb *GO-TO* in ASL had been grammaticalized and became an element to mark future.

According to Ichida (2005b: 89), *FINISH*, *COME*, and *RULE* in JSL undergo grammaticalization and become modality markers of highly probable prediction. He also pointed out that the semantic extension process of *RULE* shares a common trait with that of *besi* in Old Japanese and *must* in English. However, he did not give enough examples to explain the process by which these alleged grammatical elements are created. Thus, it is almost impossible to verify his theory. He also did not discuss the motivation of this grammaticalization.

After describing our consultants in section 3, the notation system in section 4, and the general pattern of motion expressions in JSL in section 5, we will show in

⁶ For further information on NMM, see Chapter 17 “Japanese Sign Language”.

section 6 the process by which the verb *GO* undergoes grammaticalization in four types of serial verb constructions. In section 7, we will argue that the factors that facilitate grammaticalization in Japanese can also explain the process of grammaticalization in JSL. Lastly, we will summarize our observations in section 8.

3 Consultants

JSL has variations including not only regional dialects but also variations according to the signer's age, education, and family background. We need to control these variables affecting our consultants to the extent possible, because these conditions are likely to affect their grammaticality judgments. Our five consultants are all born deaf, raised in deaf families, use JSL on a daily basis, recognize JSL as their first language, and their ages range from their middle 30s to early 50s. We will also draw on their comments on usage differences between their own and their deaf parents' sign language.

4 Notation system

A universal notation system for sign languages has not yet been established. Stokoe notation (U.S.A.) and HamNoSys (Germany) are laudable efforts, but not many researchers seem to use these methods to transcribe sign language expressions. In order to use these methods efficiently to transcribe and reconstruct expressions, researchers must memorize a large number of notation signs, and they even need to modify notation signs to accommodate each specific sign language. Accordingly, each researcher ends up creating and using his/her own method of description as needed.

For the purpose of this chapter we need a good way to describe JSL sentences as intuitively as possible and to reconstruct the expression accurately, without creating and memorizing a great number of notation signs. In this chapter, a limited number of grammatical markers such as non-manual markers (e.g., question markers) and pointings are described as certain signs, and content words are spelled out in English translation equivalents in upper-case letters. A spatial verb including a moving entity will be described with a combination of a translation of the verb and a square bracketed CL written in lower-case English translation equivalents, with the source and goal location marking, as in *aGO[man]b* 'CL (man) goes from location a to b.' Our notation system is not universal. Notation signs are as below.

Notation system

<i>SIGNa</i>	handshape of 'sign' is at location a: s, f, x, or y. s is the location of the signer f is the location of the signer's front x is the location of the signer's dominant hand side y is the location of the signer's non-dominant hand side
<i>aSIGNb</i>	handshape of a sign moves from a to b
<i>aSIGN-b</i>	handshape of a sign moves from a to b in an exaggerated manner
[<i>sign</i>]	classifier
<i>PT1</i>	first person as pointing at the signer's face or chest
<i>PT2</i>	second person as pointing at f
<i>PERF</i>	perfect aspect marker as mouth gesture PA/ FINISH manual sign
<i>O</i>	intention marker as mouth gesture O
<i>TOP</i>	topic marker as head forward
<i>NOD</i>	clause boundary marker as nodding
<i>IMP^</i>	imperative marker as chin-upward
<i>NEG</i>	negation marker as waving hand from side to side
<i>SIGN, SIGN</i>	the two signs before and after the comma occur simultaneously

5 General pattern of motion construction

5.1 Verbs: GO and COME

The verbs *GO* and *COME* in JSL are originally one word sharing the same form of handshape (downward index finger) and motion in the SS, but the directionality of movement is opposite. The tip of the index finger traces the path of the handshape movement from source to goal. When the movement approaches to the signer, it is described as *COME*; otherwise, it is *GO*.

5.2 GO and goal

The movement of the handshape of *GO* and *COME* needs to start from the location of the subject (= moving object) and end at the location of the goal.

- (1) a. *PT1 SCHOOLf sGO**f*
'I go to school'
- b. **PT1 SCHOOLf sGO**x*
(intended for) 'I go to school.'

As we can see in (1a,b), the handshape of *GO* cannot terminate its movement apart from the location of *SCHOOL* as a goal. When only the route of the moving object, such as *ROAD*, is articulated and the goal is not specified, what will happen?

- (2) a. **PT1 ROAD sGO*
(intended for) 'I go on (this) road.'
- b. *PT1 ROAD RUN*
'I run on (this) road.'
- c. **PT1 SCHOOLy RUN*
(intended for) 'I run to school.'

In this situation *RUN* is acceptable as the predicate of the sentence as in (2b) because plain verbs like *RUN* do not require pseudo-agreement with the goal. Requiring pseudo-agreement with the goal, *GO* cannot appear as a predicate in (2a). Once a goal is specified, however, *RUN* becomes inappropriate as in (2c).

- (3) a. *MANx SCHOOLy xGOy*
- b. *MAN, TOP SCHOOLy sGOy*
'He goes to school.'

Both (3a) and (3b) express the same event, 'he goes to school.' In (3a) the signer articulates *MAN* away from the signer, *SCHOOL* at *y*, and lastly moves the handshape of *GO* from *x* to *y*. The signer describes this event from the viewpoint of the observer. This is the narrator expression. In (3b), the signer moves the handshape of *GO* from the signer's place to the goal. In this protagonist expression, the signer behaves as if he/she is the subject, namely, *MAN*. A topic marker occurring with *MAN* or a pointing at *x* at the end of the sentence is often added in order to specify the subject *MAN*.

6 SVC patterns with the verb *GO*

6.1 Definition of SVC in JSL

As seen in each example from (4) to (6), the verb *GO* seems to make a construction with its adjacent verb. However, not all of these three sequences are recognized as the same usage, each of them should be distinguished from the others.

<SVC>

- (4) *WOMAN, TOP SCHOOLy RUN sGOy*
 ‘She runs to school.’

<Coordination>

- (5) (*SCHOOLy EXISTy NOD*) *MANx RUN NOD xGOy*
 ‘(There’s a school at y, and) he runs, and then he goes to school.’

<Subordination>⁷

- (6) *MAN, TOP FRIENDy HOUSEy sGOy NOD EAT PURPOSE*
 ‘He goes to his friend’s house in order to eat.’

The boldface typed verbs in these examples appear to constitute serial verb constructions. Aikhenvald (2006: 1) proposed the following conditions to identify a serial verb construction (SVC): An SVC is “a sequence of verbs which act together as a single predicate, without any overt marker of coordination, subordination, or syntactic dependency of any sort”, it “describes what is conceptualized as a single event”, and it is “monoclausal”. We will not distinguish serialization from compounding and we focus only on two-verb sequences (V1 + V2) that include *GO* or *COME* as V2. With reference to Aikhenvald’s proposal, we define a sequence of verbs in JSL as a serial verb construction only when it satisfies the condition of not having intervening elements, including nodding or a pause, between V1 and V2 and also has the four properties that V1 and V2 share aspectual value, core arguments, and modality, and negation is marked once.

- (7) a. *MANx, TOP RUN sGO^f*
 ‘He runs to (school).’
 b. *MANx, TOP RUN NOD sGO^f*
 ‘He runs, and then I go to (school).’
 c. *MANx, TOP SCHOOL^f RUN sGO^f*
 ‘He runs to school.’
 d. **MANx, TOP SCHOOL^f RUN NOD sGO^f*
 (intended for) ‘He runs to school.’

These examples above are contrasting expressions. Having no intervening elements, the predicate of (7a) is an SVC, while (7b) is a coordination because there’s a nodding between the two verbs. *RUN* and *GO* in (7a) share *MAN* as their subject;

⁷ Example (6) was expressed by one of our consultants, but other consultants gave us *EAT PURPOSE sGOx*.

in (7b), on the other hand, although the subject of *RUN* is *MAN*, the subject of *GO* can be interpreted as the first person, the signer. In the case of coordination, the ‘nodding’ divides these two verbs, so running and going turn out to be temporally separated events. Consider now (7c) and (7d). As the plain verb *RUN* cannot co-occur with a goal, (7d) is ungrammatical. On the other hand (7c) is grammatical because the predicate *RUN + GO* can co-occur with a goal. Now we will continue our observation with the sentences of (8) and (9), which are the narrator expression versions of (4) and (5). These examples are signed on the assumption that the context has specified the location of *SCHOOL* at *y* in the SS.

- (8) a. *MANx RUN xGOy PERF*
 ‘He ran to (school).’
 b. **MANx RUN PERF xGOy*
 (intended for) ‘He ran to (school).’
 c. *MANx RUN PERF NOD xGOy*
 ‘He ran and then he goes to (school).’
- (9) a. *MANx RUN xGOy NEED-TO*
 ‘He needs to run to (school).’
 b. **MANx RUN NEED-TO xGOy*
 (intended for) ‘He needs to run to (school).’
 c. *MANx RUN NEED-TO NOD xGOy*
 ‘He needs to run, and then he goes to (school).’

As the *RUN xGOy* is an SVC, it shares the aspectual value and modality as in (8a) and (9a). As seen in (8b) and (9b), neither aspect nor modality markers can intervene between the V1 and V2 of this SVC. As we can see in (8c) and (9c), in the case of the coordination examples, both aspectual and modality markers can appear between the two verbs and modify only V1, *RUN*.

- (10) a. *MANx RUN xGOy NEG*
 ‘He doesn’t run to (school).’
 b. **MANx RUN NEG xGOy NEG*
 (intended for) ‘He doesn’t run to (school).’
 c. *MANx RUN NEG NOD xGOy NEG*
 ‘He doesn’t run, and doesn’t go to (school).’

In the SVC examples of (10a) and (10b), negation should be only once per SVC after the second verb. In the case of coordination in (10c), on the other hand, in order to negate both verbs, each verb should be negated by *NEG* separately.

6.2 Four types of SVC

Observing SVCs including *GO* as V2, they can be classified into four types in terms of their meaning.

Manner type SVC

- (11) *MAN_x SCHOOL_y RUN sGO_y*
 ‘He runs to school.’

Purposive type SVC

- (12) *MAN_x RICE BALL EAT xGO_y*
 ‘He goes to eat rice ball(s).’

Cohortative type SVC

- (13) a. *EAT GO|, O*
 ‘LET’s eat!’
 b. *STUDY GO||, O*
 ‘Let’s study!’

Imperative type SVC

- (14) *EAT GO/*
 ‘EAT!’

In addition to *GO*, there are three different forms of *GO* (*GO|*, *GO||*, *GO/*) seen in the examples (13) and (14). The first is a short *GO* made at forehead level with an upturn at the end, the second is a long *GO* made with an upturn at the end, and the last is a *GO* of indeterminate length not necessarily made at a given level with a diagonal upturn at the end.

Now we will observe these four types more closely and show the process of grammaticalization.

6.2.1 Manner type

As we have already observed in example (4) *WOMAN, TOP SCHOOL_y RUN sGO_y*, the end point of the handshake movement should coincide with the goal location where the sign *SCHOOL* is articulated. Various CLs can be freely incorporated into *GO*, though this is not obligatory. *GO* can be replaced with *COME* when the directionality of motion is opposite, and this replacement does not affect the grammaticality of this construction. The manner type expression is always perfectly acceptable for all the consultants. They have been using this expression since they were very young.

They suggested that not only native signers of their own generation but also those of their parents' generation use this expression.

6.2.2 Purposive type

- (15) *PTy ROOMy RICE-BALL EXISTy NOD MANx RICE-BALL EAT xGOy*
 'There are rice balls in that room, and he goes to eat (them).'

In the case of the purposive type, the end point of the V2 handshape movement basically needs to coincide with the goal, namely, the location of the room where *rice balls* are ready to be served. When the goal location is not specified, there are cases in which the signer just directs the handshape forward and is not concerned about the 'agreement' with the goal.

The SVC in (15) does not include CL, but the moving entity (=MAN) could be incorporated as a CL as in *xGO[man]y*. When the directionality of the motion is opposite, *GO* will be replaced by *COME*. Our consultants suggest that expressions of this type are very natural, and have been widely used among the deaf of their parents' generation since they were very young. However, they noticed that the verbs that can co-occur with *GO* and *COME* in this type are increasing these days. For example, younger generations use *HELP sGO*f, while their parents' generation tends to sign *sGO[man]f NOD HELP*. One of our consultants confessed that *HELP fCOMEs* is acceptable, but *fCOMEs NOD HELP* looks better for him. We find some limitations on usage for the purposive type.

6.2.3 Cohortative type

The form of *GO* in this type should be categorized as two kinds: *GO|*, and *GO||*. Example (13a) *EAT GO|* was articulated when the signer and his/her friend were sitting side by side in front of the table on which there were wonderful dishes spread out for a feast, and they were ready to eat. The friend was so reserved that she could not start to eat. Then the signer, who wanted to start eating, encouraged his/her friend to eat by signing 'Let's eat!' As both are sitting at the table, they don't need to approach the table or dishes to start to eat. *GO|* is articulated by making a handshape of a downward index finger and quickly turning the wrist in front of the signer's forehead so that the finger points upward in the end. It is apparent that the starting and end points of *GO|* do not coincide with any locations, source or goal.

GO|| in (13b) is accepted only in very limited situations, when a signer gives a lecture or a presentation in front of an audience. It conveys the meaning that '(I will study, so) let's study together,' so *GO||* does not have the meaning of going anywhere any more. *GO||* will be articulated by making a downward index finger

and moving it forward, and pointing upward at the end of the long movement. The range of the movement of *GO||* is much wider than that of *GO|*. In spite of this difference, these two verbs have four characteristics in common: (1) the end point of the handshape movement does not coincide with any location, (2) the handshape points upward at the end of the movement, (3) they share cohortative meaning, and (4) both require the same set of NMMs representing the sense of cohortative: mouth form *O*, eye-gaze toward second person, forward head tilt, and eyebrow-up.

Despite the different size of the movements, all five consultants claimed with plenty of confidence that *GO|* in (13a) and *GO||* in (13b) were derived from *GO*. These *GO|* and *GO||* cannot be replaced with *COME* and no CLs can be incorporated. All the consultants insisted that when they were young they did not use these forms. The situation(s) that makes each of these expressions acceptable is extremely limited even today. In fact, three out of five consultants claimed that they can understand the exact meaning of the examples in (13), but would never try to use them. Consequently, it is safe to say that compared with the usages of the manner type or purposive type, these cohortative expressions have not yet become well established.

6.2.4 Imperative type

The last construction is the imperative type. Example (14) is an expression signed by a parent to his/her child who is at the table but reluctant to eat. The child is watching TV and playing with the food. His/her parent wants him/her to change his/her mind, to stop playing, and to start the action of eating. The child is sitting at the table, so the parent does not need to order him/her to go to the table. The word *GO/* is produced as a downward index finger and the tip of the finger is quickly moved diagonally from down to upward. The form of this sign therefore resembles both *GO* and *PT2*. Which, then, is the original word? There are various ways to express imperatives. By comparing *GO/* usage with these other methods, we can ascertain the original source word for *GO/*.

When a handshape of a verb is moved more quickly and larger in scale than usual, it will be recognized as imperative form. According to Kimura and Ichida (1995), the ‘chin-upward’ (*IMP^*) and the pointing at the second person (*PT2*) need to be accompanied with the exaggerated verb to produce an imperative predicate. Imperative usage differs depending on the classifications of the verbs, so we need to observe each case individually.

In the case of a spatial verb as in (16) and an agreeing verb, the handshape should be moved quickly and large in scale from the location of the second person to the goal. NMM chin-upward will be accompanied by this exaggerated sign. The starting point of the handshape movement coincides with the location of the second person as subject. This must be the reason why *PT2* following the verb is usually

omitted, when there is no need to make a special emphasis on the subject of the predicate.

- (16) *PTx fGO-x, IMP^*
 ‘GO to x!’

In the case of plain verbs, chin-upward will be added to the predicate as in (17a). *PT2* can accompany by the verb but it is not obligatory.

- (17) a. *EAT, IMP^*
 ‘Eat!’
 b. *EAT PT2, IMP^*
 ‘You eat!’

There is another method to make an imperative predicate with plain verbs. A plain verb is followed by *GO/* as in (14) and (18a) below. The form of *GO/* resembles the form of *PT2*, but we can say that these two are not identical. First of all, even if *GO/* is added to *V1*, emphasis on the second person is not made. Instead, an implication such as ‘change mind to start a certain action’⁸ may be added. Is there any evidence, then, to show the relationship between *GO/* and *GO*?

- (18) a. *BUY GO/, (IMP^)*
 ‘BUY!’ or ‘GO in order to buy!’
 b. *BUY PT2, IMP^*
 (intended for) ‘You buy!’

Our consultants had great difficulties when asked to judge the sense of (18a) in isolation. This can be interpreted as either ‘Go in order to buy’ or just ‘Buy.’ The proper interpretation is decided with contextual help. When (18a) is signed in order to urge the man who always wears the same old socks to buy new ones, then the consultant will interpret this example as the order ‘Buy.’ If this is signed to a friend who is standing in front of the shop undecided whether enter to buy a dress, the sense ‘Go in order to buy’ is the preferred interpretation. In these cases, *GO/* functions as an imperative marker, but it still holds a subtle sense of motion in the latter interpretation. Two out of five consultants suggested that *GO/* is a derived form from the verb *GO*. Now we hypothesize that *GO/* is the grammaticalized form of *GO*.

⁸ The added connotation of ‘to change one’s mind’ is equivalent to the sense of ‘to go from an old situation to a new situation.’ From the perspective of cognitive linguistics, ‘change of location’ will be metaphorically extended to the ‘change of state’ meaning. That this new connotation emerged after the process of grammaticalization also seems to suggest a semantic correlation with the original meaning of *GO*.

Our observations show that *GO/* is deeply related to the verb *GO*. However, the starting and end points of this very small motion no longer coincide with any specific locations in the SS. No CLs can be incorporated. When a mouthing accompanies *GO/* in (18a), it is not /ike/ (imperative form of *iku* ‘go’), but /kae/ (imperative form of *kau* ‘buy’). Therefore, it is natural to hypothesize that *GO/* functions as an imperative marker besides chin-upward and *PT2*. If *GO/* is a grammaticalized imperative marker, how does this happen?

Predicates in both the manner type and purposive type of SVCs also have imperative forms. In order to make imperative expressions, all we have to do is to sign *GO* as V2 more quickly and larger in size.

Manner type SVC (imperative)

- (19) a. *PTx RUN fGO-x, IMP^*
 ‘Run to x!’

Purposive type SVC (imperative)

- b. *PTx EAT fGO-x, IMP^*
 ‘Go to x in order to eat!’

Example (19b) is interpreted as ‘Go to y in order to eat.’ The imperative expression in (14) may have arisen through the loss of the coincidence of the end point of the handshape movement with the goal.

Although both *GO/* in (14) and *aGO-b* in (16), (19a), and (19b) are recognized as imperative, there are similarities and differences among them. We have already confirmed that various CLs can be incorporated into *GO* as V2 in declarative sentences of manner and purposive type SVCs. Once *GO* becomes an imperative form as in (19), it is difficult to incorporate any CLs. As we can see in (20), when a halfway frozen word such as *GO-ON-A-BUSINESS-TRIP* becomes imperative, [*man*] must be incorporated. The imperative marker *GO/* in (14) definitely disallows the incorporation of any CLs.

- (20) *TOKYOx GO-ON-A-BUSINESS-TRIP*
 fGO[man]-x, IMP^
 ‘Go on a business trip to Tokyo!’

Lastly, we would like once again to reiterate the fact that *GO* in both the manner type and purposive type of SVC is more or less replaceable with *COME*. On the other hand, *COME*⁹ never occurs as V2 in (14) in place of *GO/*.

⁹ JSL has a *COME!*, which is a word used only as the imperative ‘come.’ It makes an SVC, *STAND COME!* (‘Stand up!’), but was excluded from our discussion.

Another point we have to consider is the different level of acceptance of these two kinds of imperative expressions. Three out of five consultants accept the *GO*/imperative, but the other two, who felt some difficulty in accepting cohortative expressions, claimed that they can understand, but would never use (14). The former three consultants also explained that not so many signers in their parents' generation use *GO*/. One of the three remembered that the signer's family did not use this usage, but she gradually came to accept and use *GO*/. These comments of native signers prompt us to conclude that this *GO*/ imperative is now in the middle of the grammaticalization process¹⁰.

6.3 Four types of SVC and grammaticalization

Four types of SVCs have been compared and analyzed in terms of the form of *GO*, pseudo-agreement with the goal, CL incorporation, and interchangeability of *GO* with *COME*. The results of our observations so far are summarized in Table 2.

Table 2: Four types of SVCs and grammaticalization

GO Properties	Manner <i>aGO</i> <i>b</i>	Purposive <i>aGO</i> <i>b</i>	Cohortative <i>GO , GO </i>	Imperative <i>GO/</i>
Long path of <i>GO</i>	○	△	○ / ×	×
Goal agreement	○	△	×	×
CL incorporation	○	○	×	×
Replaceable with <i>COME</i>	○	△	×	×
	less	← grammaticalized →		more

Notes: ○: *GO* has the property, △: There are cases in which *GO* does not have the property, ×: *GO* does not have the property.

As for the least grammaticalized *GO* in a manner type SVC, both the starting and end points of the handshake movement coincide with its source and goal location, so the path of the handshake movement is rather long. CLs are often incorporated into *GO*, and if the direction of the motion is reversed, *GO* will be replaced by *COME* with no difficulty. As the verb *GO* becomes grammaticalized, it loses some of these features. In the case of the most grammaticalized *GO/* in imperative type SVCs, the end point of the handshake movement no longer coincides with the goal, so the path of the

¹⁰ We do not have any demonstrative evidence to prove the process of historical change. All are speculations predicted by signers' comments. Having no writing system, it is difficult to trace the historical change of JSL. Collecting JSL data from the older generation, and eliciting old sign language videos are urgent tasks.

handshape movement becomes short¹¹. No CLs can be incorporated, and *GO* is not replaceable with *COME*. The sense of actual motion is bleached or lost, and *GO* starts to function as an imperative marker.

6.4 Kinds of V1 in the four types of SVC

The next question that arises is what motivates this grammaticalization? We will address this question focusing on the kinds of V1.

In the case of manner type SVCs, manner verbs (e.g., *RUN*, *WALK*) can appear as V1 in the V1+V2 (*GO*) construction, while directional motion verbs (e.g., *GO*, *COME*, *LEAVE*) and action verbs (e.g., *EAT*, *STUDY*, *BUY*) cannot. The purposive type SVC excludes not only directional motion verbs but also manner verbs. Various kinds of action verbs are widely selected as the V1 of this construction. As we have observed, co-occurring verbs with *GO* in cohortative type SVCs are very much limited in both kind and number and context is also very restricted. Even for our two consultants who were accepted cohortative type SVCs, only one action verb, *EAT*, was easily accepted. Each of the two offered some other verbs, but these were not the perfect candidates. Although *GO* allows various kinds of verbs to co-occur, this usage is accepted only in a very limited situation, only at a presentation in front of a large audience.

We cannot rule out the possibility that this usage was originally borrowed from the spoken Japanese *V-te-iko-o* ‘verb-te-(go)future-intention/cohortative’ because a bilingual signer may prepare a manuscript and give a lecture by reading it. At present we do not have evidence to decide whether or not this expression was borrowed from or at least affected by spoken Japanese. When an action verb is selected as V1, the verb *DO* will co-occur as V2 (cf. *STUDY DO*, *O*), and this is more natural and acceptable. There are some similar cohortative constructions using other verbs. Precise analysis of these constructions and their relationship with *GO* cohortative expressions are issues to be explored in the future.

Lastly, in imperative type SVCs, directional motion verbs such as *GO* cannot co-occur with *GO* as V2. Because all directional motion verbs have their own imperative form (exaggerated verb with chin-upward), signers do not have to add the imperative grammatical marker *GO*. Manner of motion verbs are also not selected as V1. *GO* usually makes an SVC with action verbs such as *EAT* and *BUY*. The three types of SVCs above (i.e., manner, purposive and cohortative) do not allow directional motion verbs to occur in these constructions. The imperative type construction, however, can select even a directional motion verb such as *RETURN* as V1,

¹¹ Ichida (2005c) claims that the form of a JSL word will not be simplified even after the process of grammaticalization. However, as we have witnessed, grammaticalized *GO* is an example that changes its form, or in other words, loses its phoneme(s), following the second condition of grammaticalization.

when a certain context is offered. If some students are lingering about in the classroom until late, their teacher may order them to go back home by signing *RETURN GO/*. Once a word is grammaticalized and becomes a grammatical marker, it can co-occur with a wider variety of verbs than when it remains as a content word. This may also be evidence for grammaticalization.

Table 3: Kinds of V1 and the four types of SVC

Kinds of V1	Verbs	Manner <i>aGOB</i>	Purposive <i>aGOB</i>	Cohortative <i>GO//GO </i>	Imperative <i>GO/</i>
Directional Motion	<i>GO, COME</i> etc.	*	*	*	*
	<i>RETURN</i>	*	*	*	○
Manner of Motion	<i>RUN, WALK</i> etc.	○	*	* / ○	*
Action	<i>STUDY</i> etc.	*	*	* / ○	○
	<i>BUY</i> etc.	*	○	* / ○	○
	<i>EAT</i>	*	○	○ / ○	○
less grammaticalized				more grammaticalized	

Notes: ○: possible co-occurrence, *: impossible co-occurrence

Table 3 provides a summary of our observations so far. The kinds of verbs possible as V1 vary over the four types of SVCs according to the degree of grammaticalization. The least grammaticalized *GO* in manner type SVCs co-occurs with manner of motion verbs as V1 but cannot co-occur with action verbs, while the more grammaticalized *GO* in the purposive type can co-occur with action verbs but not with manner verbs. The most grammaticalized *GO* in cohortative or imperative type SVCs can co-occur with a wider variety of action verbs. It is found that the cline of grammaticalization correlates with the kinds of V1. Is this correlation between the degrees of grammaticalization with the kinds of V1 seen only in JSL or is it a manifestation of a broader phenomenon?

7 What facilitates grammaticalization?

Shibatani (2007) examined the *Verb-te-iku(go)/kuru(come)* converb constructions in Japanese and tried to discern the contexts that facilitate grammaticalization. He found three types of converb constructions: (1) Manner + Motion, (2) Location change + Motion, and (3) Action + Motion, and he claims that the patterns in which the events combine can be characterized in terms of the degree of semantic congruity. His hypothesis is: Grammaticalization is facilitated in semantically less congruous environments. In other words, when the event combination is less congruous, that

construction will be more grammaticalized. With this hypothesis, we can predict that in Japanese, the type of converb constructions with the Action + Motion event combination should be more grammaticalized than the converb constructions with the Manner + Motion event combination. Let me explain with the following examples.

Manner + Motion

- (21) *Taroo-ga gakkoo-ni hasit-te it-ta.*
 Taro-NOM school-to run-CON go-PAST
 'Taro went running to school.'

Location change + Motion

- (22) *Taroo-ga heya-kara de-te it-ta.*
 Taro-NOM room-from exit-CON go-PAST
 'Taro exited from the room.'

Action + Motion

- (23) *Taroo-ga ringo-o tabe-te it-ta.*
 Taro-NOM apple-ACC eat-CON go-PAST
 'Taro went out having eaten an apple.'

Example (21) is the Manner + Motion event combination. The combination of manner like *hasiru* ('run') and Motion result in a semantically congruous whole in that there is complete spatio-temporal overlap. As we can see in example (22), combinations of Location change and Motion are similarly congruous in that there is partial spatio-temporal overlap. But the overlap is not always total as in the Manner + Motion combination, because it obtains only at the point of threshold in the case of the Location change + Motion event combination. Finally, as we can see in (23), the event represented by action verbs such as *taberu* ('eat') and Motion are sequentially ordered events. Those events are not tied by unifying relations such as cause or purpose, and, as a result, lack semantic congruity. Notice that example (23) does not combine action and motion in the literal sense and has already undergone grammaticalization; compared with (23), on the other hand, more congruous examples such as (21) and (22) are not grammaticalized or grammaticalized to a lesser degree. Shibatani's hypothesis explains the difference in grammaticality between the following examples.

Manner + Motion

more congruous (not grammaticalized)

- (24) **korekaramo dondon eki-e arui-te ik-u.*
 from.now-also steadily station-to walk-CON go-PRES
 (intended for) 'From now on too (I will) keep on walking to the station.'

Action + Motion

less congruous (grammaticalized)

- (25) *korekaramo dondon sake-o non-de ik-u.*
 from.now-also steadily sake-ACC drink-CON go-PRES
 ‘From now on too (I will) keep on drinking sake steadily.’

As the combination of manner + motion events in (24) is very congruous, *iku* is not grammaticalized yet, and does not obtain an aspectual meaning. However, in the less congruous combination of action + motion in (25), *iku* undergoes grammaticalization and obtains an aspectual meaning. His hypothesis works well in Japanese. Can it be applied to JSL?

In fact this hypothesis explains the degree of grammaticalization of *GO* in JSL very well. In JSL, the combination of manner and a motion event in a manner type SVC is undoubtedly congruous. Now let’s look at the *EAT* examples of the purposive type once again. In the purposive SVCs, the events of eating and going do not overlap as in manner type SVCs, but these two events are, instead, tied by a unifying relation, in this case purpose. In cohortative and imperative SVCs, on the other hand, the events of eating and going do not overlap and are not tied together by a unifying relationship such as purpose. The events of manner type SVCs are thus more congruous than those of the purposive type, and the events of the cohortative and imperative types are much less congruous than those of the purposive. Therefore, this hypothesis predicts that the manner type is the least grammaticalized, the purposive is more grammaticalized than the manner type, and the cohortative and imperative types are much more grammaticalized. This result perfectly fits our observation of JSL.

8 Summary and conclusion

Having explored the SVCs that include *GO* or *COME* in JSL, we summarize our results as follows.

1. Four types of SVCs (V1+V2:GO) with different degrees of grammaticalization can be identified.
2. The most highly grammaticalized *GO* has been shown to function as an imperative marker.
3. A correlation between the level of grammaticalization of *GO* and kinds of V1 in SVCs has been demonstrated.
4. Shibatani’s (2007) hypothesis proposed for Japanese predicts grammaticalization in JSL.

Our observation finds similarities in grammaticalization (rather than differences) between signed and spoken language. Issues to be explored in future research on grammaticalization in JSL have been pointed out in each section.

Linguistic research on JSL has only just begun. It is true that there are a variety of unique problems for the study of sign language and needed improvements, such as developing a universal notation system, and accumulating as much data as possible to elucidate the essence of sign languages independent of their dialects or idiosyncrasies are still wanting. If linguists seek the answer to the question “What is language”, sign languages should not be excluded from our analysis. Describing the unique characteristics of each visual language is an urgent need. However, it is more significant to advance the research of sign languages on the same stage as the spoken languages. I believe this enables us to find the real universality of language. The study of sign language is a promising field that can contribute to general linguistics, and active research is eagerly anticipated.

Acknowledgments

Part of this work is supported by Grant-in-Aid for Scientific Research (C) #20520405 and #24520487 by the Japan Society for the Promotion of Science.

We sincerely thank our consultants, Hiroshi Baba, Takako Fujii, Kazumi Maegawa, Tsuyoshi Sakurai, and Mami Takaoka.

References

- Aikhenvald, Alexandra. Y. and Robert M. W. Dixon (eds.). 2006. *Serial verb constructions: A cross-linguistic typology*. Oxford: Oxford University Press.
- Bos, Heelen. 1994. An auxiliary verb in Sign Language of the Netherlands. In Inger Ahlgren, Brita Bergman and Mary Brennan (eds.) *Perspectives on sign language structure: Papers from the fifth International Symposium on Sign Language Research*. 37–53. University of Durham: The International Sign Language Association.
- Emmorey, Karen. (ed.). 2003. *Perspectives on classifier constructions in sign languages*. Mahwah, NJ: Laurence Erlbaum Associates.
- Greenberg, Joseph H. 1963. Some universals of grammar with particular reference to the order of meaningful elements. In Joseph H. Greenberg (ed.), *Universals of language*. Cambridge, MA: MIT Press.
- Greenberg, Joseph H. 1966. *Language universals, with special reference to feature hierarchies*. Janua Linguarum, Series Minor 59. The Hague: Mouton.
- Hopper, Paul J. and Elizabeth C. Traugott. 2003. *Grammaticalization*, 2nd edn. Cambridge, UK: Cambridge University Press.
- Ichida, Yasuhiro. 2005a. Shuwa no gengogaku (2): Tayōsei no mukōgawa: Shuwa no on'inkeitaikōzō (1) Furōzun goi [Linguistics of sign language (2) Beyond diversity: phonological/morphological structure of sign language (1) Frozen vocabulary]. *Gengo* 34(3). 92–99.

- Ichida, Yasuhiro. 2005b. Kūkan no bunpōka: Nihon shuwa no bunpō (2) daimeishi to dōshi no itchi [Grammaticalization of space: Grammar of JSL (2) pronouns and agreement of verbs]. *Gengo* 34(6). 90–98.
- Ichida, Yasuhiro. 2005c. Bunpōka: Nihon shuwa no bunpō (7) jodōshi, hiteigo, kōbun reberu no bunpōka [Grammaticalization: Grammar of JSL (7) auxiliary verbs, negatives, grammaticalization of construction level]. *Gengo* 34(11). 88–96.
- Janzen, Terry and Barbara Shaffer. 2002. Gesture as the substrate in the process of ASL grammaticization. In Richard P. Meier, Kearsy Cormier, David Quinto-Pozos, Adrienne Cheek, Heather Knapp and Christian Rathmann (eds.) *Modality and structure in signed and spoken languages*. 199–223. Cambridge, UK: Cambridge University Press.
- Kamata, Ryōji. 1973. Kigō toshite no shuwa – Gengogaku no ichi kadai toshite [Sign language as signs – As a problem of linguistics]. *Kōnan Joshi Daigaku Kiyō* 1. 52–67.
- Kuimura, Harumi and Yasuhiro Ichida. 1995. *Hajimete no shuwa* [First sign language]. Tokyo: Nihon-bungeisha.
- Liddell, Scott K. 1980. *American sign language syntax (Approaches to semiotics)*. The Hague: Mouton De Gruyter.
- Mathur, Gaurav and Christian Rathmann. 2010. Verb agreement in sign language morphology. In Diane Brentari (ed.) *Sign Languages*. 173–196. Cambridge, UK: Cambridge University Press.
- Padden, Carol. 1988 [1983]. *Interaction of morphology and syntax in American Sign Language*. Ph.D. dissertation. Outstanding Dissertations in Linguistics, Series IV. New York: Garland.
- Satō, Noriyuki. 1964. Shuwa ni tsuite [On sign language]. *Gengo Seikatsu* 258. 9940–9948.
- Shibatani, Masayoshi. 2007. Grammaticalization of converb constructions: The case of Japanese – te conjunctive constructions. In Jochen Rehbein and Christiane Hohenstein (eds.) *Connectivity in grammar and discourse*. 21–49. Amsterdam: John Benjamins.
- Torigoe, Takashi. 1991. Nihonshuwa no bunmatsu no ichi ni tsuite [On the sentence final location in JSL]. *Shuwagaku Kenkyū* 12. 15–29.
- Yonekawa, Akihiko. 1984. *Shuwagengo no kijutsuteki-kenkyū* [Descriptive research of sign language]. Tokyo: Meiji Shoin.

Takashi Torigoe

20 Sign language development and language input

1 Introduction

The signed language is a natural language of human beings, using a visual-gestural mode of communication, instead of spoken language's using an aural-oral mode. Linguistic research on the structure of signed languages has revealed that signed languages are fully-fledged languages, comparable to spoken languages (Klima and Bellugi 1979; Lillo-Martin 1991; Padden 1988; Sandler 1989; Stokoe 1960). From both theoretical and practical points of view, it would be interesting to investigate how deaf children acquire these languages, which employ a different mode of communication from spoken languages. Observation of their developmental processes would provide a more comprehensive picture of the human language's acquisition process.

This chapter reviews recent research on signed language development for deaf children in Japan, especially focusing on two points. One is a theoretical question concerning the relationship between gesturing and signing among deaf children when they learn a signed language as their first language. In signed language, gestures (such as pointing) and facial expressions are used as linguistic components, which might originate from non-verbal communication among hearing people and which might be conventionalized and grammaticalized diachronically in the deaf community. Therefore, the first point concerns the extent to which deaf children perceive those inputs as linguistic vs. simply gestural. It is also interesting that pre-linguistic gesturing has been found to be crucial for hearing children's development of spoken language; when an infant points at an object, and a mutual gaze toward it is shared by the infant and his/her caregiver, it can establish a foundation for the later development of a word. How is it for deaf infants acquiring a signed language? To investigate the relationship between gesturing and signing when deaf children learn a signed language, especially in its early phases of development, would provide a deeper understanding of the development of language.

The other point investigated in this chapter is rather practical. The sign language nowadays constitutes an indispensable part of education for deaf and hard-of-hearing children, as was shown, for example, in United Nations Congress on Rights of People with Disabilities (established in 2006). Sign bilingualism has been implemented for deaf children in many countries. In sign bilingualism, signed language is learned as a first language, and spoken language, mainly in written form, is learned as a second language (Svartholm 1993). However, the majority (90%–95%) of deaf children have hearing parents who do not know any signed language, at least at their birth; those deaf children cannot receive rich input in their families without

special educational support. In this connection, deaf children of hearing parents were often found to develop their own individualized gestural systems (termed “home sign”). These systems are interesting to investigate, because complex language-like structures have been found to develop with little or no language input (Goldin-Meadow 2003). Herein, I also review recent research on the conventionalization of home sign in isolated communities, which leads to the emergence of new sign languages.

In another practical context, major changes are taking place in the field of education for deaf and hard-of-hearing children, especially in developed countries such as Japan, due to the increasing prevalence of pediatric cochlear implantation, which helps deaf children to learn spoken language much more easily than before. Thus, the number of those deaf children who would acquire spoken language as a first language is increasing, though such acquisition is imperfect because of their hearing impairments. They would learn signed language as a second language. What are the developmental processes of signed language among those deaf children, and how does this learning pattern influence signed language in general? This chapter addresses issues that arise in sign language development under such atypical situations.

First, I conduct an overview of the structures of signed language. Next, I describe several previously investigated aspects of the development of signed language. Those aspects include child-directed signing, pre-linguistic communication (manual babbling and gesture), and communication during the early phases of development (pointing and facial expressions). Then, I focus on more practical research, such as home sign, its development into a sign language, and sign language learning by hard-of-hearing children and those with cochlear implants. Finally, I discuss the implications of the findings regarding signed language for developmental research and mention further possible avenues of investigation in the future.

This chapter deals primarily with research on Japanese Sign Language (JSL, or *Nihon-shuwa*, NS), the signed language of deaf community in Japan. However, Japanese research on signed language is still at an infantile stage, as compared that conducted in other developed countries, and through this research alone, the whole picture of signed language development cannot be drawn. Therefore, when needed, I also refer to research on other signed languages, especially American Sign Language (ASL) and signed languages in European countries.

2 An overview of Japanese Sign Language

Words of signed language (we call it “sign”) are composed of three sub-lexical components: the hand-shape, the movement of the hand, and the place of the hand. To

give an example, THINK¹ is produced by extending the index finger (hand-shape), which contacts (movement) with the head (the place). Those sub-lexical components are combined simultaneously, in contrast with spoken language, in which phonological components, vowels and consonants, are combined sequentially.

The signed language has a rich morphological system. In JSL, each phonological component of the sign changes morphologically (Torigoe 1997). The classifier is a kind of the hand-shape morphemes, designating the categories (human, animal, vehicle, or airplane) and/or the size and shape of the actors or themes. To give an example, the C hand-shape, which is used as the classifier for vehicles, being combined with various descriptive movements and other classifiers, would express various meanings concerning vehicles, such as driving to or from (moving the C hand-shape toward or away from the special location in the signing space), parking (placing the C hand-shape in a given location within the signing space), and cars crashing (striking the C hand-shape with another C hand-shape).

The placements of the hand mark the subjects and objects of some verbs (which we call “inflecting verbs”). For example, the citation form of the verb TALK-TO² is represented by moving the hand forward. When we express “you talk to me,” we move the hand inwardly, from the place of YOU to the place of ME. In another group of verbs (we call them “spatial verbs”) the placement of the hand indicates the starting and ending points of transportation. When we express “I move to Tokyo from Kyoto,” the hand moves from the place where KYOTO is produced to the place where TOKYO is produced.

The movement of the hand also changes variously to add aspectual meaning to the verb. For example, when the form of the verb GIVE (originally represented by moving the flat hand forward once) is changed to repeated, quick forward movement, it implies that “(he/she) always gives (something) to (someone),” or the habitual aspect of the verb.

Signed language is composed not only of the hands and fingers but also of non-manual behaviors, such as facial expression, body orientation, gaze direction, and head and mouth movement. Non-manual behaviors mainly serve various grammatical functions; for example, body orientation while signing indicates who is talking to or acting on whom. Some facial expressions mark the type of sentence, such as yes/no or wh question, conditional sentence or topicalization.

1 A JSL sign is represented by an English word in capital letters, we call it “gloss”, the nearest English translation of the JSL sign. JSL and English are different languages, so there is no one-to-one correspondence between JSL signs and English words.

2 When more than one English word is needed to gloss a JSL sign, the English words are separated by a hyphen.

3 Early development of JSL

3.1 Motherese in the signed language

Language environment and input are important factors for children's acquisition of both signed and spoken language. How do deaf adults talk or sign to their infants and toddlers? Are there child-directed speech (CDS), or "motherese" registers in JSL?

Torigoe (1995) observed deaf children aged 1-3 years in natural settings with their mothers in an attempt to describe how deaf mothers talked to and interacted with their children using JSL. He reported that deaf mothers used various CDS patterns; some of them were specific to signed language, while others were shared with spoken language. One specific pattern was that the mothers extended their signing space to overlap with the children's, even though they did not demonstrate a tendency to overlap their signing space while talking with other adults. Another pattern was that the mothers controlled their children's articulation by hand, molding the signs in their children's hands when the children could not form the signs alone. This pattern was specific to signed language, as hearing mothers would not try to control their children's articulators (e.g., mouth and tongue) to mold their spoken words.

Torigoe and Takei (1998, 2000) also observed picture-book reading between one deaf mother and her child longitudinally. This situation is interesting to investigate, because signed language is a visual language; therefore, it may be difficult for deaf children to pay attention simultaneously to both the adult's signs and the book, while hearing children can easily pay attention to both the adult's utterances and the book (i.e., hearing speech while looking at the pictures). They described several strategies employed by the deaf mother, who attempted to catch her child's attention while looking at the pictures. One strategy was that the mother produced her signs on or near the pictures, not in her usual signing space. The mother was sometimes observed to produce her signing directly on the child's body. Those strategies found in JSL were also employed by ASL users (Swisher 1992) and are seemingly common to various signed languages. Those attempts might enable children to pay attention to both their mother's signing and pictures simultaneously. Masataka (1992) experimentally recorded signing mothers' CDS and their signing to their deaf friends, and compared these two quantitatively. The results showed that in the former, their hands moved more slowly, some signs were repeated more frequently and were somewhat more exaggerated than in the latter, suggesting that "motherese" is used in JSL. In addition, Masataka (1996) examined the influence of these signed CDS to deaf infants' reception. For that purpose, he made two videotapes, which recorded the mothers' reciting of identical scripts in JSL either towards their infants or toward their deaf friends. When those tapes were presented to deaf infants, they showed greater attentional and affectional responsiveness to infant-directed signing than to adult-directed signing. Those findings suggest that "motherese" plays a substantial role in the acquisition of JSL by deaf children.

3.2 Pre-linguistic gesture and manual babbling

Takei and Torigoe (2000) longitudinally examined children's early development of JSL by observing the relationships between pre-linguistic gestures and the first signs in deaf children acquiring JSL as a first language. They recorded hand activities from infants aged 5–14 months and classified them into 3 types: (1) non-referential gestures (rhythmic and repetitious movements of the hands, seemingly without any communicative intention), (2) referential gestures (communicative gestures, such as pointing), and (3) signs (JSL signs). During this period, non-referential gestures first increased in frequency with age, and then they sharply decreased after the first sign was observed. The researchers also reported continuity between the movements that comprised non-referential gestures and the first signs. Those findings suggest that non-referential gestures may constitute “manual babbling,” which is analogous to vocal babbling, as shown by research on ASL development (Meier and Willerman 1995; Petitto and Marentette 1991). Takei and Torigoe (2000) also indicated that referential gestures (mainly, pointing gestures) rapidly increased before 1 year of age and decreased after the first occurrence of signs, which paralleled hearing infants' acquisition of spoken language. This indicates that pre-linguistic gestures were crucial to the later development signs/words among both deaf and hearing infants acquiring signed and spoken languages, respectively.

3.3 Pointing gesture

Pointing is used in the signed languages examined thus far, not only as referential terms such as demonstratives and personal pronouns, but also as a grammatical means (Klima and Bellugi 1979; Lillo-Martin 1991; Torigoe 1994), indicating that it constitutes an indispensable building block of the structure of signed language. From a developmental point of view, the pointing gesture is interesting to investigate; not only it is widely known that hearing children communicate extensively with pre-verbal pointing gestures when they learn spoken language, but also they produce combinations of one word and one gesture (mostly, pointing) before the onset of two-word sentences (Butcher 1994). Takei and Torigoe (2001) described pointing behaviors in deaf children aged 4 months – 2 years who were acquiring JSL and compared them with those observed in their hearing counterparts who were acquiring spoken Japanese. The results showed that false two-sign combinations (in which a single sign and pointing were combined) could be classified into two types: semantic one-sign sentences (i.e., the pointing and the sign indicated the same concept) and semantic two-sign sentences (i.e., the pointing and the sign represented different concepts). The former decreased and the latter increased with age, suggesting that the pointing gestures contribute to the emergence of two-sign sentences.

Torigoe and Takei (2001) also investigated the transition process from the one-word to multi-word stages in deaf children who were acquiring JSL 2–3 years after birth. Quantitative analysis of the spontaneous utterances of deaf children showed that more than 30% of the tokens were pointing gestures; in contrast, less than 10% were demonstratives and person pronouns in their hearing counterparts who were acquiring spoken Japanese (Okubo 1967). Thus, deaf children use pointing very frequently in their earlier stages of signed language development. Next, they qualitatively described pointing behavior during the earlier stage of word combinations in an attempt to examine its role in organizing sentences. At first, the children used the pointing gesture referentially, such as PT(fish)³ FISH, meaning “this is a fish,” and then they tended to produce redundant pointings in the final position of the sentence, such as PT(there) COOK PT(there), meaning “I cooked there.” Finally, those redundant pointings came to play a grammatical role in organizing sentences, such as PT(he) NAME-SIGN COME PT(he) BE-GIVEN PT(he), meaning “the man identified by his name sign came here and gave this to me.”

3.4 Facial expression

In signed language, facial expressions were used linguistically as adverbs, grammatical markers, and so on, as well as non-linguistically. How do deaf children who acquire signed language as a first language come to use facial expressions linguistically?

Reilly, McIntire, and Bellugi (1990) and Reilly and McIntire (1991) observed and described how deaf infants acquiring ASL develop grammatical facial expressions. At first, deaf children could use rich facial expressions non-linguistically (e.g., emotionally), but they did not use them grammatically. For example, interrogative sentences, such as yes/no and why questions, are usually marked by grammatical facial expressions. At first, however, deaf children did not use this marker, instead, they simply signed and looked at the interlocutor, awaiting his/her reply (this “looking at and waiting” seemed to function as an interrogative), or they expressed questioning words such as WHAT without accompanying interrogative facial expressions. Deaf children began to use these grammatical facial expressions after they reached 3–3½ years of age. It might be interesting that mothers and other caregivers also did not use such grammatical facial expressions while they talked to their infants (Reilly and Bellugi 1996). In the earlier phases of signed language development, facial expressions seemed to be used only for emotional exchange between the infant and his/her mother, being inhibited from use as grammatical markers.

³ PT indicates the pointing gesture, and the parenthesized object, person, or place preceded by PT represents the object, the person or the place pointed at.

Anderson and Reilly (1997) and Reilly and Anderson (2002) reported on the development of negation in ASL, focusing on the relationship between gestural negation (head-shake) and the sign denoting negation. As shown in the development of grammatical expressions above, deaf infants first expressed only the negation sign without head shaking; several months later, however, they became able to express the negative facial expression with signs. This result indicated that although deaf infants expressed the head-shake pre-linguistically, they needed to acquire this same form once again linguistically.

In JSL research, Torigoe (1995) reported on how deaf infants develop linguistic facial expressions. Though linguistic facial expressions usually co-occurred with signs among adult signers, deaf infants first produced signs and facial expressions sequentially, not simultaneously. One deaf toddler expressed yes/no questions as such, first producing a sign (GO) and then presenting a yes/no facial marker (eyebrows raise and nod) afterwards, not as expressing a sign and facial marker simultaneously. Several months later, the toddler could produce signs and facial markers simultaneously. Another example concerns the adverbial facial expression meaning “very” which is expressed with closed eyes and a frown. When the deaf toddler signed “very fast,” she expressed first the sign (FAST) and then the facial adverbial “very” sequentially; several months later, she came to express them simultaneously.

The sequential combination of constituents before the development of simultaneous combination was also observed through analysis of phonological errors committed by deaf toddlers (Torigoe 2006). As described in section 2, a sign is comprised by three elements: (1) hand-shape, (2) movement, and (3) the place of the hand. The way deaf children expressed some signs indicated that the phonological elements were produced one-by-one, not simultaneously. For example, OLDER-BROTHER was usually expressed by deaf adults as moving the hand-shape (extending the middle finger) upward (i.e., the hand-shape and movement were produced simultaneously.) One deaf child expressed this sign as such; first, she put the hand-shape in front of her chest, and then moved that hand-shape upward. In another example, she first moved her hand upward without making any specific hand-shape, then articulated that hand-shape deliberately, and finally moved it upward again.

Thus, the facial expressions of deaf children acquiring signed language were non-linguistic at first, and then became linguistic when learned as such. The combination of sign and facial expression was first produced sequentially, then simultaneously, as shown in the development of other simultaneous structures.

4 Language input and home sign

4.1 Poor output in an atypical situation

Next, the relationship between sign language development and language input will be discussed. As described above, only 5%–10% of deaf children, who are born into deaf families, can acquire a signed language as their first language in signing

environments from birth. The majority of deaf children, who have hearing parents, acquire signed language in an atypical situation: their signing input is not so rich and can be delayed. How does this atypical situation influence the development of signed language? Previous research has indicated that this type of environment has a substantial negative impact on development.

Newport (1988) compared the levels of sign language attainment among three groups of deaf adults: (1) native signers who had deaf parents; (2) early learners who had hearing parents and entered deaf schools (where they acquired the signed language) when they were 4–6 years of age; and (3) late learners who learned sign language after they were aged 12 years. The task was to produce and understand signed sentences, including verb morphology. The results showed sharp differences among these groups. The more delayed was the child's first exposure to signed language, the more difficult it was for them to understand and produce the morphology of signed language, irrespective of the subsequent duration of exposure of signed language. Emmorey, Bellugi, Friederici, and Horn (1995) also investigated the influence of age of first exposure of ASL on the processing of ASL sentences among the same groups as Newport (1988). The task was to detect grammatical errors in ASL sentences. The results showed that the performance of native signers was superior to that of the other two groups; in addition, this tendency was stronger when the subjects processed sentences grammatically, such as subject – object agreement, as compared when they processed sentences semantically, such as aspectual morphology. These results suggested that age at first exposure to signed language, not overall duration of exposure, was the crucial factor in the full development of signed language, especially its core grammatical structures.

Mayberry, Lock and Kasmi (2002) also examined the age at first exposure to language input, comparing the same three types of groups, and obtained similar results. They created an additional distinction by dividing the late learners into two groups: late signers as a first language and late signers as a second language. The former were congenitally deaf and had hearing parents; they were assumed to acquire signed language as a first language, though their exposure to input was delayed. The latter subjects had acquired deafness; they were born hearing, acquired spoken language as a first language, and then became hearing-impaired and learned the signed language as a second language. The level of attainment of signed language among the former was found to be lower than that of the latter, suggesting that the full development of a first language was another crucial factor for further language learning.

As for the atypical situation of the development of signed language, the exposure of deaf children to language samples also must be considered. Even if deaf children have deaf parents, their parents' parents might be hearing, and, therefore, their signed language exposure might have been delayed; then, the signed language input to their deaf children might deteriorate. That is, the deaf children of deaf parents might not get perfect signed language input, either. How does this situation

influence signed language attainment among deaf children? Singleton and Newport (2004) studied deaf children whose parents acquired signed language after adolescence, comparing the children's signed utterances with those of their parents. The results showed that the signed utterances of the participating deaf children achieved the native signers' level of attainment at 7 years of age, outgrowing their deaf parents' signed utterances. This result suggests that even with imperfect input (called a "pidgin"), the child can develop a full language (or "creole") during one generation only if he/she receives language input at a sufficiently early stage⁴. In this respect, the signed language would be a unique language, which always involves a "creolization" process (Bickerton 1981).

4.2 Home sign

The study of home sign is also interesting in terms of language input and language development. Deaf children of hearing parents have been reported to develop home sign, or an individualized gestural system for communicating with surrounding people. Goldin-Meadow (2003), who had investigated home sign extensively, found that various linguistic structures develop naturally under environments with poor or no language input. Her subjects were deaf children whose parents were hearing, who favored the oral method for their children's education, and who did not like to use signed language in their homes. In this situation, deaf children and their parents spontaneously developed gestural communication systems in their homes, which she called home sign. Goldin-Meadow linguistically analyzed the structure of home sign utterances from various levels. Syntactically, home sign utterances by deaf children had comparable and consistent sign order, such as actor – act, and theme – act. In another analysis of syntax, Goldin-Meadow collected 2-unit utterances from samples of home signs, and specified what kind of semantic roles were fulfilled by each sign. The results showed that among actions with intransitive meanings, actors and acts tended to be expressed in 2-unit utterances; further, among actions with transitive meanings, themes and actions tended to be expressed, while actors to be omitted.

As for the morphology of home sign, noun-like signs were expressed with reduced movements, and verb-like signs were expressed as movements that were changed according to actor and theme. Home sign seems to have a distinction between nouns and verbs, as do other languages; further, the method of distinction found in home sign is shared with other signed languages such as ASL (Supalla and Newport 1978). Goldin-Meadow (2003) also found a sub-lexical level in home signs,

⁴ A pidgin is a simplified language that develops as a means of communication between two or more groups that do not have a language in common. A creole language, on the other hand, is a stable, full-fledged language that originated from a pidgin.

indicating that a sign was constituted by the combination of limited numbers of hand-shapes and movements of the hand, which is also found in conventionalized signed languages as described in section 2.

In terms of language input, these tendencies in home sign structures were consistent among different deaf children, while they were not shown in the utterance of mothers' gesturing; this indicates that deaf children did not learn home sign structures from their mothers. This might suggest that a home sign with complex structure could be generated spontaneously by a deaf child without little or no spoken or signed language input.

4.3 Conventionalization: from a home sign to a new signed language

How is home sign conventionalized diachronically, and by what process does it become a new signed language? These questions would be theoretically and practically interesting to investigate. However, Goldin-Meadow's (2003) research indicated that home sign by deaf children would disappear when they were exposed to a signed language. Therefore, we cannot determine the consequences of this home sign. Home sign that has continued to be used and shared among local communities has been investigated in Japan.

Osugi, Supalla and Webb (1999) observed the gestural communication systems used among deaf and hearing people in the isolated island of Amami in Japan. By using word elicitation tests, these researchers found three distinctive systems: (1) non-linguistic gestures, (2) isolated home sign systems, and (3) highly developed home sign systems. From interviews, they found that three deaf brothers had first developed a family home sign, which was shared and conventionalized by other deaf and hearing people around them; it was then transferred to the next generation when one of three deaf brothers got married and had children who learned this gestural system.

Torigoe, Takei, and Kimura (1995) also observed gestural communication systems used among deaf and hearing people in isolated islands in Japan, focusing mainly on the "grammar" of their developed home sign systems. These researchers conducted field research in the Okinawa Islands, where they found several villages containing deaf people who continued to use home sign and shared it with hearing people. Through interviews and observation, it was found that a home sign was developed in a family and then continued to be used and conventionalized throughout a small village. Most home signs were apparently complex systems that deaf people produced very fluently according to various kinds of signs and "grammar." Many hearing people in those villages reported that they naturally learned "the way deaf people talk" and became able to use it because they were in contact with each other frequently over long periods of time. Through this communicative environment

among deaf and hearing people, home sign seemed to be maintained and extended into a more complex, conventionalized system of signs. Takei, Torigoe, and Yokkaichi (1997) and Torigoe and Takei (2002) investigated one of those conventionalized home signs linguistically. The subjects were two deaf sisters who were aged over 60 years when they first met the investigators. They both had profound deafness and had had no experience of schooling; further, until then, they had had no contact with other deaf people who used JSL. It was assumed that a home sign had developed in their family without any inputs from conventional signed or spoken languages, then spread throughout a small village where these two sisters were the only deaf people.

The results showed that pointing was used frequently and variously in this system. Pointing gestures were found to refer not only to the present person, object, or place, but also to non-present objects. Moreover, it was shown that some instances of pointing were referentially redundant and occupied fixed positions of sentences, suggesting that they were used as grammatical terms. Example sentences are:

- (1) **PTi EAT GROW-FAT PTi/ GROW-FAT PTi GOOD**
 “He (i) ate and got fat, so he is good” (i: the man sitting next to the listener)
- (2) **PTi CARPENTER PTi DRINK BE-DRUNK PTi**
 “The carpenter (i) was drunk” (i: outside)
- (3) **CRY PTi ACHE-IN-HAND CRY ACHE-IN-HEAD CRY PTi**
 “She cried as if saying that she was in pain here (hand) and there (head)”

Pointing (underlined) tended to occupy fixed positions in sentences (e.g., phrase- or clause-final positions) and seemed to organize the gestural utterance hierarchically into phrases and clauses, as shown in (1') - (3'); this suggests that pointing served a grammatical role.

- (1') **[PTi EAT GROW-FAT PTi]/ [GROW-FAT PTi] GOOD**
- (2') **[PTi CARPENTER PTi] DRINK BE-DRUNK PTi**
- (3') **[CRY PTi [ACHE-IN-HAND CRY ACHE-IN-HEAD CRY]] PTi**

This home sign has been used by two deaf sisters, who were deaf from childhood, and it has been shared with the hearing people around them. Thus, we can say that this circumstance of home sign development was very rich, and this richness might have elevated its complexity further, resulting in a form of grammar. Another interesting point is that pointing was used both lexically and grammatically, as in conventionalized signed languages such as JSL. At present, the temporal ordering and/or overlap of their conventionalized processes has not been determined. We need diachronic data regarding home sign in order to clarify the conventionalized processes of home sign development.

Several studies are investigating the processes by which developed home sign systems have become new signed languages. Wendy Sandler and colleagues have been researching a new signed language, which they call Al-Sayyid Bedouin Sign Language, and this sign language has been used in the last 70 years in a small, isolated village with a high incidence of deafness (Meir et al. 2010; Sandler 2012; Sandler et al. 2005). She and her colleagues have linguistically investigated Al-Sayyid Bedouin Sign Language. They concluded that it was created spontaneously without any apparent external influence from conventionalized signed languages. They also identified four generations (which they call “age groups” or “stratum”) of the language’s users and succeeded in clarifying the progression of its structures through these four generations. Through Sandler et al.’s research, we might obtain a whole picture of the developmental process of a signed language, from non-linguistic gestures, through home sign and developed home sign, to fully fledged signed language.

Another diachronic analysis of home sign developing into a new signed language has also been conducted. In Nicaragua, there was no education for deaf children until the 1980s because of a civil war. Then, schools for deaf children were established with aid from USA. The deaf children congregated in the schools, and most of them were found to have their own home signs. American researchers observed how a new signed language, Nicaraguan Sign Language, developed from these home signs over a long period of time (Senghas 1995).

Senghas (2003) and Senghas, Kita, and Ozyurek (2004) investigated these deaf children’s competencies of the signed language, dividing them into two groups: one who enrolled in the school immediately after the school was established and the other who enrolled several years later from its establishment. They investigated the expression and understanding of sentences, including morphological changes of verbs, and narratives. The results showed sharp differences between the two groups, the latter outperforming the former. This trend suggested that home sign brought into the school by the first generation of deaf children was shared and conventionalized among them; these conventions then became the language inputs to the later generation of deaf children, resulting in the emergence of a signed language with more complicated and elaborated structures.

5 Bilingualism and education for deaf children

5.1 Bimodal bilingualism as compared with mono-modal bilingualism

The deaf community can be said to be a bilingual community in which both signed and spoken languages are used daily; therefore, their situation is analogous to that of other linguistic minority communities in which two spoken languages, a minority

language and a majority language, are used; the former are, we can say, bimodal bilinguals with a spoken language and a signed language; the latter are mono-modal (unimodal) bilinguals with spoken languages. Thus, deaf children are bimodal bilinguals, who not only grow up in a signed language environment, but they are also simultaneously exposed to a spoken language used by people around them. Are there similarities or differences between mono-modal bilingualism and bimodal bilingualism? How does this bilingual situation influence the development of signed language and spoken language for deaf children, and what are the relationships between the two languages? From a practical point of view, one of the important issues in deaf education has been whether the acquisition of a signed language has a supportive or a negative influence on the learning a spoken language.

Petitto, Holowka, Sergio, and Ostry (2001) and Holowka, Brosseau-Lapre, and Petitto (2002) compared the acquisition of vocabulary between mono-modal bilinguals and bimodal bilinguals. The subjects were three French-English bilingual hearing children and three bilingual hearing children who spoke French and Quebec Sign Language. There was no difference between the two groups concerning the ages of acquisition of the first word and 50 words. Moreover, they investigated the ratio in words of translation equivalent (TE), which were different words translated into different languages. The rate of TE in the whole vocabulary was approximately 30% and did not differ between mono-modal and bimodal bilinguals. Though the bimodal bilingual children were sometimes observed to speak while simultaneously signing, they built different vocabulary systems for each language, as did mono-modal bilinguals.

Capirci, Iverson, Montanari, and Volterra (2002) longitudinally observed one hearing child who had deaf parents and grew up in a bilingual environment of signed and spoken languages, comparing him with another hearing child who was mono-lingual in a spoken language. As for spoken language development, both of the hearing children showed a vocabulary spurt at 1½ years of age, and they displayed the same vocabulary size, indicating no influence of sign language environment on the acquisition of spoken language. However, there were differences between the two children in terms of pre-linguistic gesturing. The hearing child who was raised in a signing environment produced many more (and more varied) gestures than the hearing child in a non-signing environment. The signing environment seemed to promote the development of the pre-linguistic gestures that form the basis of language development, as described in 3–2.

Morgan (2000) observed bimodal bilingual (spoken English and British Sign Language) hearing children, focusing on the developmental processes of discourse coherence. The results indicated similar development among the two languages concerning the use of pronouns, verb inflections, anaphora of verb phrases, and changes in framework during talking (signing).

The above results indicated that hearing bimodal bilingual children fully developed both signed and spoken language in both quantity and in quality (as compared

with mono-modal bilinguals and monolinguals) when they received rich input. However, deaf children usually do not receive full input from spoken language because of their hearing impairments, even if they wear hearing aids or get cochlear implanted. In addition, most deaf children were born into hearing families and did not to receive perfect input in signed language, as described in 4-1.

Sign language usually comes into contact with spoken language, and sign language users are more or less bilingual. Therefore, research on sign language development should be done considering this point of view, despite the paucity of this kind of research.

5.2 An attempt at bimodal, bilingual education for deaf and hard-of-hearing children

Signed language, which has been oppressed for a long time in many countries, has not been used in deaf education in Japan, except for the earlier period of deaf education history. Around 20 years ago, however, some deaf schools decided to implement signing into classrooms from the preschool level. The use of sign language has spread into the schools for the deaf since then. Most schools for deaf children have implemented sign language or signing in the classroom in addition to spoken Japanese.

Torigoe (2004) described ethnographically the bilingual situation of those signing deaf schools with a focus on the teachers' attempts to use signed language in both the classroom and teaching activities. The results showed that the levels of bilingualism in the classrooms differed depending on the teachers' knowledge of and attitude toward sign language and on deaf people's involvement in the classroom activities. The children were truly bilingual, sometimes engaging in code-switching; they used only JSL among themselves, but they sometimes used spoken Japanese while signing simultaneously with hearing teachers. Many hearing teachers still believed that signing with speaking simultaneously was the best method of communication in the classroom. Further, a child-centered atmosphere, rather than a teacher-centered one, was important for pushing the classroom further toward bilingualism.

Another study on the development of signed language was being conducted from a practical point of view. Currently, many deaf and hard-of-hearing children in developed countries, including Japan, enroll not in special schools for the deaf but in the regular schools because of the development of medical technologies such as digital hearing aids and cochlear implants⁵, which enable them to use their residual hearing and speech far more than was possible before.

5 A cochlear implant is a surgically implanted electronic device that provides a sense of sound to a person who is profoundly deaf or severely hard of hearing.

These children in regular schools participate partially in regular classrooms (using their residual hearing and speech), and partially in special classrooms (using both speech and signs). Their first language is assumed to be spoken Japanese, though it is generally imperfect because of their hearing impairment. Torigoe (2012) examined how hard-of-hearing and cochlear implanted children learn signed language as a second language from a socio-cultural point of view. As an educational intervention, they were regularly taught JSL by a deaf teacher, and their learning process was examined from a socio-cultural point of view. The results showed that they first learned signed language not as a language but as a new way of communication without voices. They used to use spoken Japanese for communication in their every-day lives, even among themselves. While they were learning JSL from a deaf teacher, however, they came to stop using their voices, not only when they signed, but also when they performed gesturing (when they could not communicate with a deaf teacher, they often used gestures) or spoke Japanese (when they talked to a deaf teacher, their voices were reduced to mouthing.) This was most of these children's first experience of encountering a deaf person, and to learn a new language for them was to learn another way to communicate with him and to become acquainted with part of Deaf culture. The number of deaf and hard-of-hearing children who enroll in regular schools is increasing in Japan and other developed countries. In this situation, deaf children who derive benefits from hearing aids or cochlear implants are still hearing impaired and have a need for signed language (or at least signing for communication). We need to learn more about the learning processes of deaf and hard-of-hearing children as they acquire signed language as a second language in order to provide them with effective support.

6 Discussion and further research

Research on signed language development has provided two indications thus far. First, the developmental process of signed language is similar to that of spoken language. Second, signed language is visual-gestural in nature, in contrast to spoken language; this unique characteristic brings about a different picture of the developmental process. The above described research on JSL development also related to these two characteristics. As for the first characteristic, I dealt with motherese, pre-linguistic gestures, babbling, and word combinations in JSL, which were all shared with spoken languages. As for the second characteristic, the mother's signing style while reading, sequential errors, and the unique role of pointing gestures found in JSL seemed to be specific to sign languages, though (as stated in the introduction) cross-linguistic research among signed languages must be performed in order to arrive at a general conclusion.

We need to know more about the developmental process of sign language for deaf children of hearing parents (who constitute the majority of deaf children), while research conducted so far has focused mainly on deaf children of deaf parents. In this connection, it might also be interesting to researchers of language development that most deaf children acquired sign language in atypical situations. Further, home sign (a gestural communication system that develops without the influence of any language) is involved somehow in their development of signed language. New signed languages that have developed from home signs are interesting areas of investigation in this research field.

In the Japanese context, the development of JSL is worth studying further. Signed language has recently begun to be implemented in deaf schools, though the education of deaf children has traditionally been and is still primarily reliant upon residual hearing and speaking (which we call the oral method) and signed language has been treated rather negatively. How do signing deaf children acquire Japanese? What is the relationship between Japanese and Japanese Sign Language for deaf children? Moreover, how does the acquisition of JSL facilitate their learning Japanese? These questions are challenging and should be tackled from a practical point of view. As described above, signed language has always existed in bilingual situations. Therefore, in order to investigate the development of signed language, we need to concurrently examine spoken language. Educators of deaf children would like to know the effects of sign language acquisition on the development of spoken language, reading and writing performance, and achievement in general. Some studies have indicated that it has facilitative effects (Chamberlain, Morford, and Mayberry 2000), though those studies were descriptive and relational in nature.

Another practical study is also needed. It would be useful to investigate how hard-of-hearing and cochlear implanted children learn signed language as a second language. As described above, most deaf, hard-of-hearing, and/or cochlear implanted children in Japan currently enroll in regular schools, where they still have a need for signed language (or just signing) in the classroom. We need to learn more about the learning processes of deaf and hard-of-hearing children in order to develop more suitable support systems in regular schools, such as co-enrollment programs in which both bilingualism and inclusion would be guaranteed for deaf and hard-of-hearing children (Antia, Kreimeyer, and Reed 2010).

References

- Anderson, Diane E. and Judy S. Reilly. 1997. The puzzle of negation: How children move from communication to grammatical negation in ASL. *Applied Psycholinguistics* 18(4). 411–429.
- Antia, Shirin D., Kathryn H. Kreimeyer, and Susanne Reed. 2010. Supporting students in general education classrooms. In Marc Marschark and Patricia Elizabeth Spencer (eds.), *Oxford handbook of deaf studies, language, and education*, 2, 72–92. New York: Oxford University Press.

- Bickerton, Derek. 1981. *Roots of language*. Ann Arbor, MI: Karoma.
- Butcher, Cynthia. 1994. *The onset of gesture-speech integration*. Chicago: The University of Chicago dissertation.
- Capirci, Olga, Jana M. Iverson, Sandro Montanari, and Virginia Volterra. 2002. Gestural, signed and spoken modalities in early language development. *Bilingualism: Language and Cognition* 5(1). 25–37.
- Chamberlain, Charlene, Jill P. Morford, and Rachel I. Mayberry. 2000. *Language acquisition by eye*. Mahwah, NJ: Lawrence Erlbaum.
- Emmorey, Karen, Ursula Bellugi, Angela Friederici, and Petra Horn. 1995. Effects of age of acquisition on grammatical sensitivity. *Applied Psycholinguistics* 16(1). 1–23.
- Goldin-Meadow, Susan. 2003. *The resilience of language: What gesture creation in deaf children can tell us about how all children learn language*. New York: Psychology Press.
- Holowka, Siobhan, Francoise Brosseau-Lapre, and Laura A. Petitto. 2002. Semantic and conceptual knowledge underlying bilingual babies' first signs and words. *Language Learning* 52(2). 205–262.
- Klima, Edward and Ursula Bellugi. 1979. *The signs of language*. Cambridge, MA: Harvard University Press.
- Lillo-Martin, Diane. 1991. *Universal grammar and American Sign Language*. Dordrecht: Kluwer.
- Masataka, Nobuo. 1992. Motherese in a signed language. *Infant Behavior and Development* 15(4). 453–460.
- Masataka, Nobuo. 1996. Perception of motherese in a signed language by 6-month-old deaf infants. *Developmental Psychology* 32(5). 874–879.
- Mayberry, Rachel I., Elizabeth Lock, and Hena Kasmi. 2002. Linguistic ability and early language exposure. *Nature* 417, 38.
- Meier, Richard P. and Raquel Willerman. 1995. Prelinguistic gesture in deaf and hearing infants. In Karen Emmorey and Judy Snitzer Reilly (eds.), *Language, gesture, and space*. 391–409. Mahwah, NJ: Lawrence Erlbaum.
- Meir, Irit, Wendy Sandler, Carol Padden, and Mark Aronoff. 2010. Emerging sign languages. In Marc Marschark and Patricia Elizabeth Spencer (eds.), *Oxford handbook of deaf studies, language, and education*, 2. 267–280. Oxford: Oxford University Press.
- Morgan, Gary. 2000. Discourse cohesion in sign and speech. *International Journal of Bilingualism* 4(3). 279–300.
- Newport, Elissa L. 1988. Constraints on learning and their role in language acquisition. *Language Sciences* 10(1). 147–172.
- Okubo, Ai. 1967. *Yōji gengo no hattatsu* [Development of child language]. Tokyo: Tōkyōdō.
- Osugi, Yutaka, Ted Supalla, and Rebecca Webb. 1999. The use of word elicitation to identify distinctive gestural systems on Amami Island. *Sign Language and Linguistics* 2(1). 87–112.
- Padden, Carol. 1988. *Interaction of morphology and syntax in American Sign Language*. New York: Garland.
- Petitto, Laura A. and Paula F. Marentette. 1991. Babbling in the manual mode: Evidence for the ontogeny of language. *Science* 251. 1483–1496.
- Petitto, Laura A., Siobhan Holowka, Lauren E. Sergio, and David Ostry. 2001. Language rhythms in babies' hand movements. *Nature* 413. 35–36.
- Reilly, Judy S. and Diane E. Anderson. 2002. FACES: The acquisition of non-manual morphology in ASL. In Gary Morgan and Bencie Woll (eds.), *Directions in sign language acquisition*. 159–181. Amsterdam: John Benjamins.
- Reilly, Judy S. and Ursula Bellugi. 1996. Competition on the face: Affect and language in ASL motherese. *Journal of Child Language* 23(1). 219–239.

- Reilly, Judy S. and Marina McIntire. 1991. WHERE SHOE: The acquisition of wh-questions in American Sign Language. *Papers and Reports on Child Language Development* 30. 104–111.
- Reilly, Judy S., Marina McIntire, and Ursula Bellugi. 1990. Conditionals in American Sign Language. *Applied Psycholinguistics* 11(4). 369–392.
- Sandler, Wendy. 1989. *Phonological representation of the sign*. Dordrecht: Foris.
- Sandler, Wendy. 2012. Designated gestures and the emergence of sign language. *Paper presented at the 5th Conference of the International Society for Gesture Studies, Lund University, Sweden*.
- Sandler, Wendy, Irit Meir, Carol Padden, and Mark Aronoff. 2005. The emergence of grammar: Systematic structure in a new language. *Proceedings of the National Academy of Sciences* 102(7). 2661–2665.
- Senghas, Ann. 1995. *Children's contribution to the birth of Nicaraguan Sign Language*. Cambridge, MA: The Massachusetts Institute of Technology dissertation.
- Senghas, Ann. 2003. Intergenerational influence and ontogenetic development in the emergence of spatial grammar in Nicaraguan Sign Language. *Cognitive Development* 18(4). 511–531.
- Senghas, Ann, Sotaro Kita, and Asli Özyürek. 2004. Children creating core properties of language. *Science* 305(5691). 1779–1782.
- Singleton, Jenny L. and Elissa L. Newport. 2004. When learners surpass their models. *Cognitive Psychology* 49(4). 370–407.
- Stokoe, William. 1960. Sign Language Structure. *Studies in Linguistics, Occasional Papers*, 8. New York: Dept. of Anthropology and Linguistics, University of Buffalo.
- Supalla, Ted and Elissa L. Newport. 1978. How many seats in a chair? The derivation of nouns and verbs in American Sign Language. In Patricia Siple (ed.), *Understanding language through sign language research*. 91–131. New York: Academic Press.
- Svartholm, Kristina. 1993. Bilingual education for the deaf in Sweden. *Sign Language Studies* 81. 291–332.
- Swisher, Virginia M. 1992. The role of parents in developing visual turn-taking in their young deaf children. *American Annals of the Deaf* 137. 92–100.
- Takei, Wataru and Takashi Torigoe. 2000. Rōji no shuwa gengo kakutoku katei ni okeru hi-shiji jesucha no yakuwari [Nonreferential gestures and the acquisition of sign language by two Japanese infants]. *Hattatsu Shinrigaku Kenkyū* 11(1). 12–22.
- Takei, Wataru and Takashi Torigoe. 2001. The role of pointing gestures in the acquisition of Japanese Sign Language. *Japanese Journal of Special Education* 38(6). 51–63.
- Takei, Wataru, Takashi Torigoe, and Akira Yokkaichi. 1997. Ritō ni sumu seijin-rōsha ga jihatsushita miburi no keitaironteki bunseki [A morphemic analysis of the gestural system produced by sisters who are deaf, living on an isolated island]. *Tokushu Kyōikugaku Kenkyū* 35(3). 33–41.
- Torigoe, Takashi. 1994. Resumptive X structure in Japanese Sign Language. In Ingel Ahlgren, Brita Bergman and Maria Brennan (eds.), *Perspectives on sign language structure*. 187–198. Durham: The International Sign Linguistics Association.
- Torigoe, Takashi. 1995. Rōji wa ikani shuwa o manabuka: Dai-ichi gengo to shite no shuwa no shūtoku katei [How deaf children learn a sign language: acquisition processes of sign language as a first language]. *Shuwagaku Kenkyū Monogurafu* 5.
- Torigoe, Takashi. 1997. Shuwa no kakutoku [The acquisition of the signed language]. In Harumi Kobayashi and Masato Sasaki (eds.), *Kodomo-tachi no gengo kakutoku*. 211–235. Tokyo: Taishukan.
- Torigoe, Takashi. 2004. Deaf education and bilingualism: Signed and spoken languages. In Masahiko Inami, Kobayashi, Harumi, Mineharu Nakayama and Hidetosi Sirai (eds.), *Studies in Language Sciences* (3), 55–65. Tokyo: Kurosio Publishers.
- Torigoe, Takashi. 2006. Japanese Sign Language, In Mineharu Nakayama, Reiko Mazuka and Yasuhiro Shirai (eds.), *Handbook of East Asian psycholinguistics: Japanese*. 137–143. New York: Cambridge University Press.

- Torigoe, Takashi. 2012. How hard-of-hearing children learn a signed language? A socio-cultural analysis. *Poster presented at the 5th Conference of the International Society for Gesture Studies, Lund University, Sweden.*
- Torigoe, Takashi and Wataru Takei. 1998. Chōkaku shōgaiji no shuwa ni okeru kaiwa no seisei [Emergence of dialogue in signed language by deaf infants]. *Paper presented at 36th annual meeting of Japanese Association of Special Education, Bunkyo University.*
- Torigoe, Takashi and Wataru Takei. 2000. Rō-boshi no ehon yomi bamen ni okeru taiwa to katari [Dialogue and narrative between deaf mother and her deaf toddler during book-reading]. *Paper presented at 38th annual meeting of Japanese Association of Special Education, Shizuoka University.*
- Torigoe, Takashi and Wataru Takei. 2001. A descriptive analysis of early word combination in deaf children's signed utterance. *Japanese Psychological Research* 43(3). 156–161.
- Torigoe, Takashi and Wataru Takei. 2002. A descriptive analysis of pointing and oral movements in a home sign system. *Sign Language Studies* 2(3). 281–295.
- Torigoe, Takashi, Wataru Takei and Harumi Kimura. 1995. Deaf life on isolated Japanese islands. *Sign Language Studies* 24(87). 167–174.

Subject index

- academic language proficiency 98, 100, 105–106, 111, 123
- acquisition process 4, 7–8, 13, 142, 145–146, 149, 170, 216, 251, 269, 280, 284, 291–295, 309, 311, 330, 333, 511, 528
 - first language (L1) 4
 - second language (L2) 7–8, 142, 145–146, 149, 170, 216, 251, 269, 184, 291–295, 309, 311, 330
 - Sign Language 528
- addressee honorific xxvi, 151, 171, 173
- age effects 67, 70, 72–73, 75–76, 77, 82, 85–89, 90, 91
- age of onset (AO) 69, 72, 79, 82, 84, 90, 91
- age of testing (AOT) 75, 79–81, 83
- agreement auxiliary 443, 449, 451, 455
- agreement verb 448–450
- alienation 425
- ambiguity/ambiguities 152, 173, 367, 369, 374, 376, 378–379, 380
- American Council on the Teaching of Foreign Languages (ACTFL) 157, 177–179, 184, 197, 283, 285, 287, 309, 312, 322
- authenticity 7, 176, 178–179, 189–190
- autism spectrum disorders (ASD) 29, 41, 337–338, 346–348, 361, 363, 364, 365, 380
 - high-functioning autism spectrum disorders (HFASD) 10–11, 368–374, 376–378, 380
- automaticity 189–190, 221
- avoidance 132, 136
- babbling 339, 345, 364, 515
 - manual babbling 512, 515, 525, 527
- baby talk (*see also* caregivers' speech, IDS/CDS, and motherese) 4, 17, 38, 40, 269, 279, 435
- bilingual xv, 1, 3, 5–6, 9, 13, 14, 67, 77, 82, 90, 91, 92, 94, 95, 97–123, 124, 125, 206, 217, 218, 219, 221, 248, 251, 265, 271–271, 274, 277, 391, 410, 427, 504, 511
 - bilingual bias 82
 - degree of bilinguality 121
 - sign bilingualism 511, 522–525, 526, 527, 528
- bit (unit of information) 470, 476, 479–480
- caregivers' speech (*see also* baby talk, IDS/CDS, and motherese) 4, 17, 31, 32
- case particles/case markers
 - case markers x, xii, xix, 18, 268, 278, 279, 281, 342–343, 357, 359, 363, 365, 376, 485
 - case particles xx, xxiii, 22, 150, 259, 260, 261, 262, 264, 266–267, 276, 279, 293, 294, 297, 341, 342, 344, 350, 353–355, 357–359, 361, 365
- cheremes 444–445
- Child Language Data Exchange System (CHILDES) xv, 9, 14, 251, 255–268, 269–274, 276, 277, 278, 279, 280, 313, 316, 317, 321, 323, 316, 317, 321, 323, 326, 328, 332, 333, 364
- chunks/chunking 129, 137, 141, 144–148, 149, 160, 166, 186, 318
- classifier xiii, xiv, xxii, xxx, 165
 - classifier (CL) 483, 490–491, 494, 508, 513
- cochlear implantation 361, 363, 366, 512, 524–526
- coding tag 256
- cognitive mechanisms 200, 213, 216
- cognitive transfer 98–99, 120
- cohortative xxx, 483, 498–500, 503–505, 507
- Common European Framework of Reference for Languages (CEFR) 177–179
- common underlying proficiency (CUP) (*see* proficiency)
- comparative fallacy 134, 136, 139, 141, 148, 319–320, 331, 333
- complexity* (the amount of load with which a syllable is burdened) 467, 475, 479, 481
- Computer-aided Error Analysis (CEA) (*see* error analysis)
- concordance 398
 - concordance program 398
 - concordance software 398
- contrastive analysis (CA) 129, 130–133, 138, 147–148, 314, 334
 - Contrastive Interlanguage Analysis (CIA) 318–320
- corpus 8–9, 137, 260, 264–269, 271, 273, 283–309, 313, 392, 398–399, 468–469, 472, 477
 - annotated corpus 283, 288–290, 295, 300–301, 303, 307, 309, 311
 - corpus analysis 255, 274, 318–319, 388, 397–399

- corpus linguistics xii, xv, 2–3, 8–9, 11, 147, 274, 313, 318, 320, 328, 330, 390–391, 398, 409–410
- KY corpus xv, 9, 283–309, 310, 311, 312, 322, 324, 327, 332
- learner corpus/corpora 9–10, 149, 283–284, 291, 308–309, 311, 313–330, 331, 332
- text corpus 293, 289
- critical period(s) 5, 68–75, 85–86, 89, 90, 91, 92, 93, 94, 191
- critical period hypothesis (CPH) 5, 67, 68–72, 77, 79, 83, 85, 89, 90, 91, 92, 93, 94
- cross-linguistic commonalities and differences 17, 23
- data sharing 272, 273
- deaf 12, 338–339, 344, 443, 448, 454, 455, 481, 484, 493, 499, 518, 522
- deaf children 68, 69, 103, 339–342, 345, 362, 363, 364, 365, 366, 447, 511–512, 514–526, 527, 528, 529
- deaf education 123, 125, 341–342, 344, 447, 511, 518, 523–526
- deductive style 421
- discourse community 11, 385, 390, 392, 397–398, 409
- domestication 425, 436
- Dominance Condition 458–461, 466, 479
- double articulation 444
- English for specific purposes (ESP) 11, 385, 389–392, 395, 397, 409–410, 411, 412, 413
- equivalence 426
 - dynamic equivalence 426
 - formal equivalence 426
- error analysis (EA) 9, 129–130, 132–134, 136, 142, 146, 147, 148, 149, 150, 199, 284, 289, 296, 314, 318, 320, 333
 - Computer-aided Error Analysis (CEA) 318–320
- error(s) xv, 7, 111–112, 115–117, 120, 129–148, 149, 188, 200, 210, 226, 256, 268–169, 271, 272, 289, 290, 292, 296, 297, 300, 303–307, 311, 314, 315, 317–318, 320, 321, 323, 324–325, 327, 331, 341–344, 350, 351, 353–354, 359, 363, 365, 398, 409, 517–518, 525
- focus on form (FonF) 200–201, 205–208, 210, 212–215, 217–218
- foreignization 425
- genre
 - genre analysis 389, 409–410, 412, 413
 - genre-based translation model 385, 387, 392, 394–395, 397, 404, 410
- grammar analysis 259
- hearing impairment(s) xv, 10, 337–340, 343–344, 350, 362, 363, 365, 512, 524, 525
- heterogeneity 436, 457, 467, 479
- hiragana* xv, xvi, xvii, xviii, 4, 43–58, 60, 62, 63, 113, 114, 175, 182, 186, 187, 192, 193, 194, 258
- home sign 3, 512, 517, 519–522, 526, 529
- imitation 4, 8, 9, 13, 17, 25, 27–29, 31, 36, 37, 39, 40, 41, 81, 121, 129–131, 133–134, 136, 147, 191, 196, 217, 236, 274, 291, 309, 329, 332, 350–351, 424, 428, 430, 474, 499
- imperative xxxi, 281, 355, 401, 404, 483, 489, 492, 494, 498, 500–505, 507
- indirect requests 10, 368, 376, 381
- individual differences 5, 17–19, 25–26, 28, 31, 36, 37, 40, 67, 83–87, 112, 151, 153, 158–159, 170, 216–217, 221, 340, 344, 358
- infant-directed speech (IDS)/child-directed speech (CDS) (*see also* baby talk, caregivers' speech, and motherese) 17, 32–36, 514
- information* (the concept used in information theory) 467–468
- intellectual disability/intellectual disabilities 337–338, 346–347, 350, 358, 360–361, 363, 364, 365, 366
- intention-reading skill 17, 26, 27
- interaction xi, xii, xiii, 4, 7–9, 14, 25–28, 37, 39, 49, 71, 81–82, 89, 107, 110, 115, 130–131, 147, 152, 154, 157–158, 160, 167–168, 171, 172, 200, 115, 130–131, 147, 152, 154, 157–158, 160, 167–168, 171, 172, 200, 203, 210–211, 219, 220, 221, 223, 225, 250, 251, 256, 261, 265, 270, 275, 276, 279, 280, 281, 287, 294, 298, 346, 349, 361, 394, 455, 457–458, 461, 463–467, 475–476, 478–480, 509, 527
- interlanguage 9–10, 14, 94, 129–130, 133–134, 136, 142, 145, 148, 149, 150, 173, 197, 205, 219, 220, 284
- irony 10, 359, 368–369, 373, 376, 378, 435

- Japanese as a Second/Foreign Language (JSL/JFL) 130, 133–134, 146, 204, 206, 214, 215
- Japanese as a Foreign Language (JFL) 7, 171, 203, 206–207, 213, 214, 225–228, 230–249, 351
 - Japanese as a Second Language (JSL) 12, 108, 111, 137–138, 142, 144, 147, 183, 207, 213, 283, 284, 290, 291, 311, 312, 316, 322, 324, 327
 - acquisition of Japanese as a second language (AJSL) 199, 201, 202–203, 206, 207, 209, 212, 213–215, 217–218
- Japanese Communicative Development Inventories (JCDIs) 18, 22, 37
- Japanese language pedagogy 199, 201, 213, 217, 218
- Japanese Language Proficiency Test (JLPT) 7, 175, 177, 180–181, 196, 198, 205, 283
- JF Standard (the Japan Foundation's Standard for Japanese-language education) 177–178, 198
- kanji* 4, 43, 46, 47, 62, 64, 113, 114, 115, 118–120, 183, 195, 258, 268, 273, 372
- (logographic) *kanji characters* 113
- katakana* xv, xvi, xvii, xviii, 4, 43–48, 113, 114, 258
- Labovian methodology (see also narrative) 8, 224–230, 246, 271
- learners' levels 283, 290, 292, 294–295, 297, 301, 306–307
- learning strategies 7, 99, 102, 129–130, 137, 146, 149, 150, 303
- length of residence (LOR) 76, 79–80, 83, 91, 94, 104–106, 108, 124, 125
- lexical development 21, 23, 38, 39, 41, 339, 346
- linguistic interdependence principle 5, 14, 97–98, 103, 106–107, 112
- literacy xv, 1, 3–6, 14, 43–63, 97, 99, 102–103, 108, 114–119, 123, 124, 125, 148, 149, 251, 271, 277, 359–360, 390–391, 409, 438
- emergent literacy 43, 47, 102, 116, 118, 119
 - systemic literacy 390–391, 409
- literal comprehension 11, 367, 369, 371–373, 376–379, 380
- nonliteral comprehension 367, 369, 371–373, 376–378
 - overnonliteral comprehension / overnonliteralness 368, 380
- MacArthur-Bates Communicative Development Inventories (MCDIs) 17–18, 24, 37, 38
- mean length of utterance (MLU) 32, 256, 259–261, 269, 277, 278, 282, 349, 353–355, 358, 364, 365
- JMLU 349–350
 - MLU in morphemes (MLUm) 277, 349, 358
- media (audio, video) 9, 154–155, 185, 255, 257, 264–266, 270, 272, 277
- mental representation 17, 29
- meta-analysis 38, 202–204, 206, 212, 215, 218, 220, 221, 362
- metaphors 10, 99, 100, 122, 344, 365, 368, 369, 373, 376, 378, 379, 380, 381, 501
- monolingual bias 82
- mora(s)/morae xii, xvi, 34, 44–46, 49–53, 56–57, 60, 6, 63, 175, 186, 187, 292, 360, 416
- mother
- mother-child 9, 59, 115, 131, 259, 265–266, 270–271, 276, 281
 - mother-infant 27, 35, 40, 90
 - motherese (see also baby talk, caregivers' speech, and IDS/CDS) 4, 17, 514, 525, 527
- move analysis 397, 404
- multiple dynamic age affects 85–86
- narrative xiv, 8–9, 14, 101, 103, 149, 173, 191, 202, 223–251, 271, 276, 277, 323, 332, 359, 522, 529
- complicating action (Labovian narrative component) 224, 227–231, 234, 238, 246–247
 - content-focus approach 225
 - evaluation (Labovian narrative component) 229–231, 234, 239–244, 246–247, 250
 - evaluative (narrative component/function) 224, 227–231, 234, 237–244, 246, 247
 - orientation (Labovian narrative component) 224–225, 227–231, 234, 237–244, 246–247
 - personal narratives 8, 223–227, 229, 246–248, 277
 - referential (narrative element/function) 224, 229–230
 - reported speech 229–230, 232, 234, 239–241, 243–247
- naturalization 425
- Nihongo Taiō Shuwa*, Manually Coded Japanese (MCJ) 443–444, 453–454, 455
- non-alphabetic language 113

- non-manual markers (NMMs) 444, 450–452, 454, 483–484, 492, 500
- OCHA (Observe, Classify, Hypothesize, Apply) 392, 397–398, 404, 409–410, 412
- oral proficiency interview (OPI) 157, 177–178, 184, 197, 283, 285, 287, 291, 298, 300, 307, 308–309, 310, 311, 312, 322, 333
- PAIL (Purpose, Audience, Information, Language features) 393, 397, 399–402, 410
- passive voice 341, 408, 422–423, 426
- phonemes of sign language 444–445, 457–458, 467
- phonotactics 12, 457, 466–467
– JSL phonotactics 457
- pointing (PT) 345, 449, 452–453, 455, 484, 489–490, 493–495, 500, 511, 512, 515–516, 521, 525, 528, 529
- pragmatic competence 151, 172, 173, 178
- probability 71, 468–474
- proficiency xv, 3, 7–8, 14, 69, 71, 73–74, 77–79, 81, 83–85, 88, 98–123, 124, 125, 158, 169, 175–197
– common underlying proficiency (CUP) 5, 99–100, 102, 104, 112, 118, 120, 121, 123
- real-time processing 73, 81, 185–186
- referential xiii, xxii, 23, 27–28, 29, 151, 152, 155, 275, 387, 515–516
- research study of the effect of instruction 199, 202, 205, 213, 217, 218
- rhythm of Japanese xii, 38, 44
- Romanization for Japanese xvii–xviii, 182, 257–259
- school-age children 6, 97–98, 102, 124, 347, 358–359, 373
- second language xv, 1, 3, 5, 7–10, 12, 14, 68, 71, 90–95, 97–125, 129–150, 152, 154, 172, 173, 176, 183, 186, 197, 198, 199–222, 223–225, 250, 251, 258, 266, 268, 271, 276, 277, 280, 281, 283, 294, 309, 310, 311, 312, 313–334, 351, 387, 411, 412, 413, 511
– Japanese as a Second Language (see Japanese as a Second/Foreign Language)
– signed language as a second language 512, 518, 525–526
- sentence-final pointing 452–453, 455
- serial verb constructions (SVC) 493, 495–499, 502–505, 507
- Shushi Nihongo*/Signed Japanese 12, 453, 455
- sign language v, xv, 2, 3, 12–13, 69, 103, 272, 275, 344–345, 365, 443–455, 457–481, 483–509, 511–529
- signed language 12, 483, 489, 492, 511–526, 527, 528, 528
– signed language development 511–516
- signing space (SS) 13, 488–490, 513–514
- Simple Performance-Oriented Test (SPOT) 7, 175–176, 182–187, 189–192, 194–196, 197, 198
- skopos/Skopos theory 11, 427–430, 437
- social cognitive base 17, 26, 41
- specific language impairment (SLI) xiv, 10, 338, 346, 350–354, 361, 363, 364, 365, 366
- speech learning model 77
- speech style 32, 109, 151–157, 159–162, 167–169, 171, 420
- storytelling 8, 62, 223, 245, 248
- study abroad 153, 156–157, 159, 170, 171, 172
- style shift 7, 151–160, 167–168, 170, 171, 172, 173
- syllable xvii, 12, 34, 44–46, 51, 56–57, 63, 175, 187, 258, 339, 416, 451, 457–480, 481
– maximum syllable information constraint 479–480
– well-formed syllables 339, 457, 479–480
- Symmetry Condition 458–461, 479
- teaching for transfer 6, 120, 121, 123, 125
- textbook and language test development 284
- the-effect-of-instruction research (see research study of the effect of instruction)
- theory of mind 37, 270, 276, 282, 365, 367–368, 371, 378, 380
- transfer 97, 103, 107, 110, 120–122, 124, 131–134, 136, 139, 150, 208, 215, 219, 220, 247, 248, 421, 426
– cross-lingual transfer xv, 5–6, 97–98, 103, 110, 120
- translation xv, xviii, xxi–xxiii, 1–3, 9, 11, 170, 175–176, 210, 223, 260, 297, 322, 334, 385–413, 415, 439, 450, 493, 513, 523
– interlingual translation 415
– intralingual translation 415–416
- type-token ratio 235–237, 248

- U-shaped patterns of behavioral growth 248, 304
- verb inflections 132, 261–262, 268–269, 292, 353, 355, 523
- vocabulary 10, 18, 73, 75–76, 101–103, 203, 223, 249, 243, 358–360, 362, 404, 418, 433, 508
 - vocabulary acquisition/development/growth/progress 17–18, 23–25, 28–34, 36, 40, 41, 99, 162, 167, 225, 269, 278, 312, 340, 523
 - vocabulary comprehension 4, 21, 24–25, 28–31, 36, 37, 344, 346
 - vocabulary production 18–22
 - vocabulary size 234–236, 246–248, 297–298, 340, 346–347, 523
 - vocabulary strata/system x, xi, 348
 - vocabulary tests 104–107, 109, 111–120, 124, 175–176, 180–181, 183–184, 187, 190, 195, 354–356, 366, 428
- word boundaries 258–259, 289